PD CA 1101

Network-enabled Software for Offline Storage and Retrieval of Bibliographic Information of Documents for C-CADD

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Contents

1) Introduction

During various activities undertaken for design, implementation and testing of various aircraft development projects like SARAS, HANSA, NM5, etc at C-CADD, NAL, numerous project documents and internal reports were released. There was a need to keep track of bibliographic details of these documents, so that their key information can be easily retrieved and accessed.

To fulfill the above necessity, the software “Document Information System” is developed to maintain the offline information of various documents for various flight projects. This report discusses briefly about the Document Information System Software.

2) About the Project:

The "Document Information System" is developed for the purpose of maintaining project document information for various projects. This software can be effectively used to maintain document information according to the specified ATTA chapters also.

Here fourteen categories (fields) are specified for each bibliographic entry of a document. The specified information that is stored includes:

- ✓ Document Number,
- ✓ Title,
- ✓ Date_of_Issue,
- ✓ Date_Brought on charge,
- ✓ Author,
- ✓ Keyword,
- ✓ Security Classification,
- ✓ Type of Document and
- ✓ Location.

The major information fields such as Projects, Subprojects, System Name, Chapter Name and Chapter Number is also considered along with this categories.So all together fourteen information fields are stored and form the project document information. This information can be added, searched and edited using this software.

3) Software and Hardware Information:

Development of offline DIS is based on the following software and hardware:

3.1) Software Specification

Microsoft Visual Studio 6.0
Microsoft Visual Basic 6.0
MS-Access 6.0

3.2) Hardware Specification

Processor: Intel (R) Pentium

Hard disk space: 40GB

RAM: 252908 KB.

Network Card: Standard Ethernet card for networking.

I/O Devices:Keyboard, mouse and Color monitor

Cable: Twisted pair for networking.

3.3) Platform

Operating System : Windows XP Professional, SP2

4) Software environment

The "Document Information System" software is developed using Microsoft Visual Studio 6.0 as the environment, Microsoft Visual Basic 6 as the language for front end development and MS-Access 6.0 as the backend database.

Visual Studio 6.0:

Microsoft® Visual Studio® 6.0 is a powerful developer tools suite for Windows and Web applications

Visual Basic

Paradigm	Object-based and Event-driven
Developer	Microsoft
Stable release	VB6 (1998)
Typing discipline	Static, strong
Influenced by	Quick BASIC
Influenced	Visual Basic .NET, Gambas, REALbasic, Basic4ppc
OS	Microsoft Windows, MS-DOS
Website	http://msdn.microsoft.com/en-us/vbasic/default.aspx

Visual Basic (**VB**) is the third-generation event-driven programming language and integrated development environment (IDE) from Microsoft for its COM programming model. VB is also considered a relatively easy to learn and use programming language, because of its graphical development features and BASIC heritage.[1]

Visual Basic was derived from BASIC and enables the rapid application development (RAD) of graphical user interface (GUI) applications, access to databases using Data Access Objects, Remote Data Objects, or ActiveX Data Objects, and creation of ActiveX controls and objects.

Scripting languages such as VBA and VBScript are syntactically similar to Visual Basic, but perform differently.

A programmer can put together an application using the components provided with Visual Basic itself. Programs written in Visual Basic can also use the Windows API, but doing so requires external function declarations.

The final release was version 6 in 1998. Microsoft's extended support ended in March 2008 and the designated successor was Visual Basic .NET (now known simply as Visual Basic).

Microsoft Access 6.0:

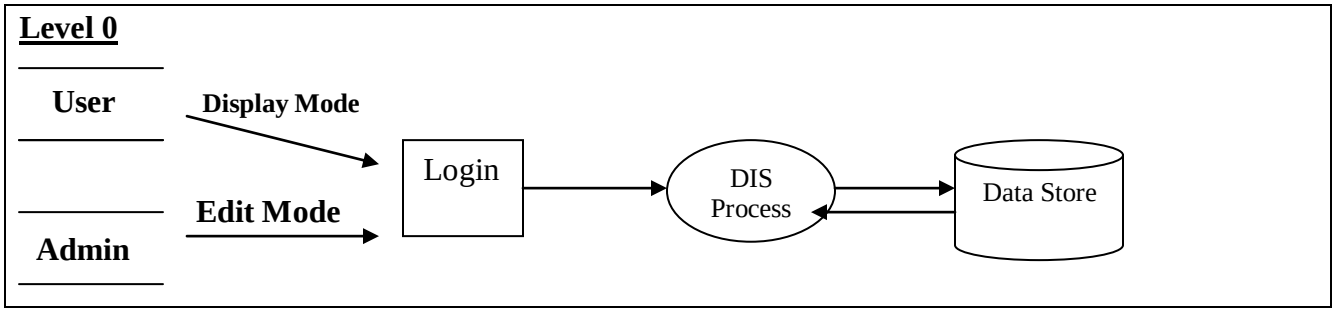
Microsoft Office Access, previously known as **Microsoft Access**, is a pseudo-relational database management system from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and software-development tools. It is a member of the Microsoft Office suite of applications, included in the Professional and higher editions or sold separately. In mid-May 2010, the current version Microsoft Office Access 2010 was released by Microsoft in Office 2010; Microsoft Access 2007 was the prior version. Access stores data in its own format based on the Access Jet Database Engine. It can also import or link directly to data stored in other applications and databases.

Software developers and data architects can use Microsoft Access to develop application software, and "power users" can use it to build simple applications. Like other Office applications, Access is supported by Visual Basic for Applications, an object-oriented programming language that can reference a variety of objects including DAO (Data Access Objects), ActiveX Data Objects, and many other ActiveX components. Visual objects used in forms and reports expose their methods and properties in the VBA programming environment, and VBA code modules may declare and call Windows operating-system functions.

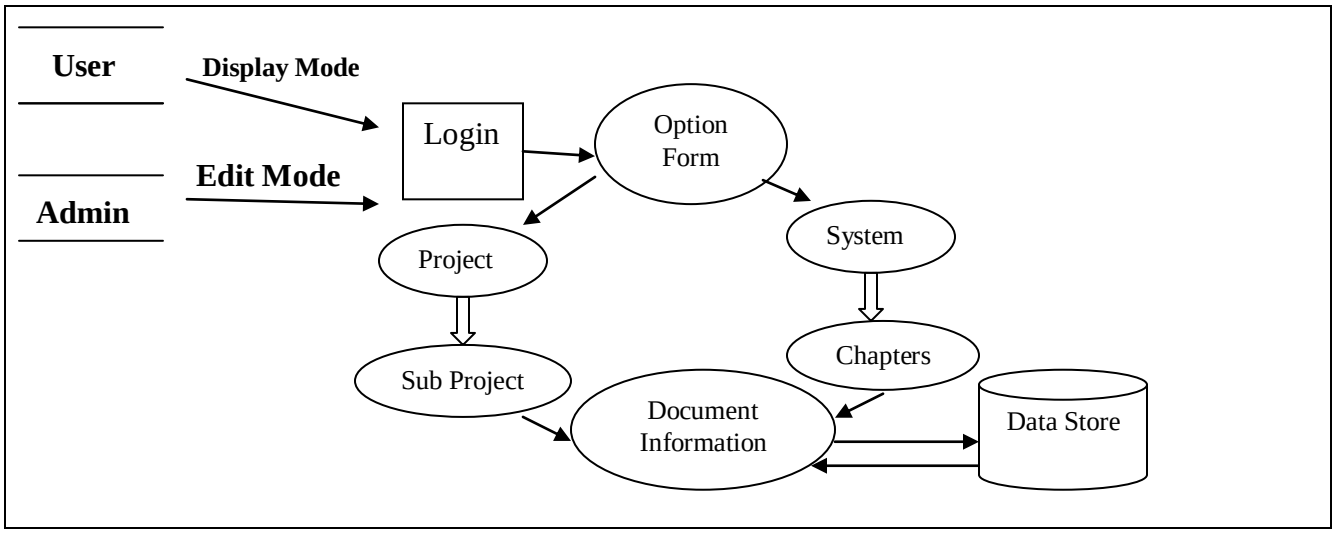
5) Data Flow Diagram

In this section, instructions of various menu items of DIS are shown with the help of data flow diagrams

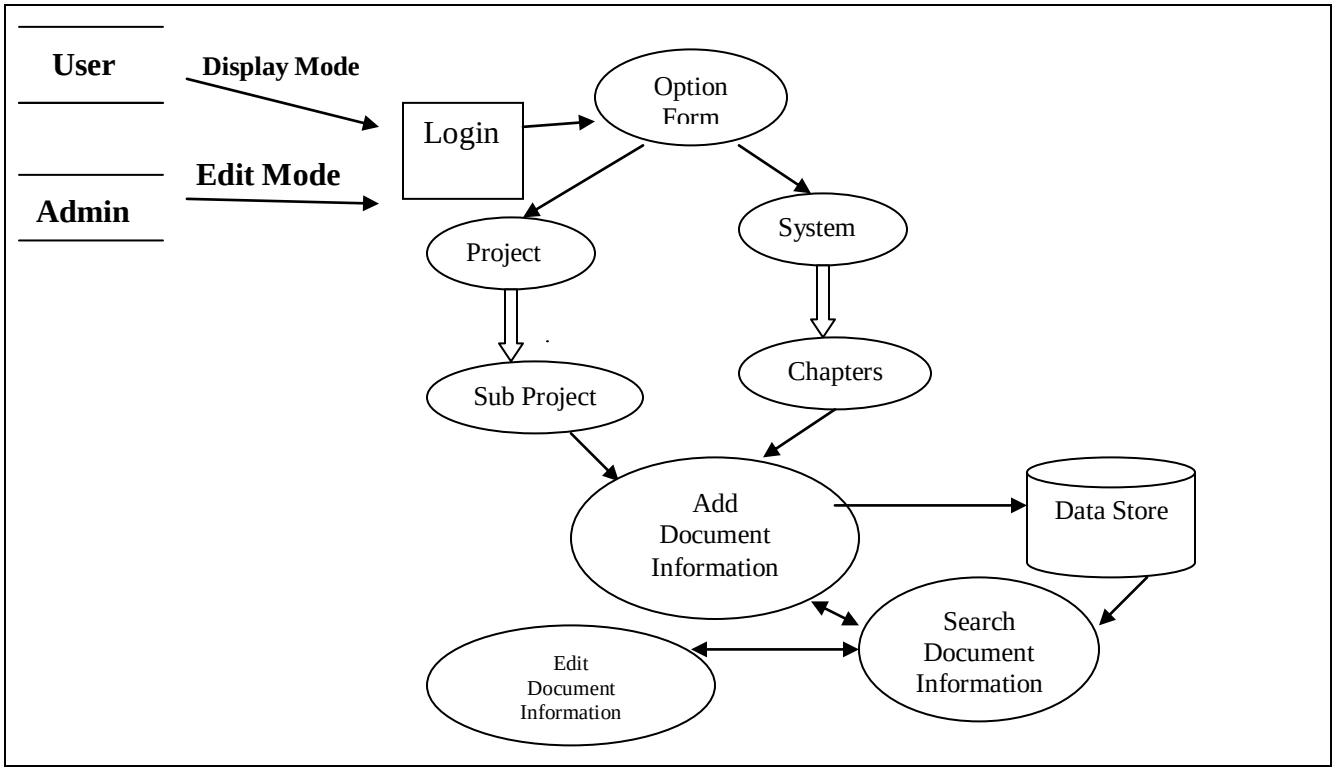
Level 0



Level 1

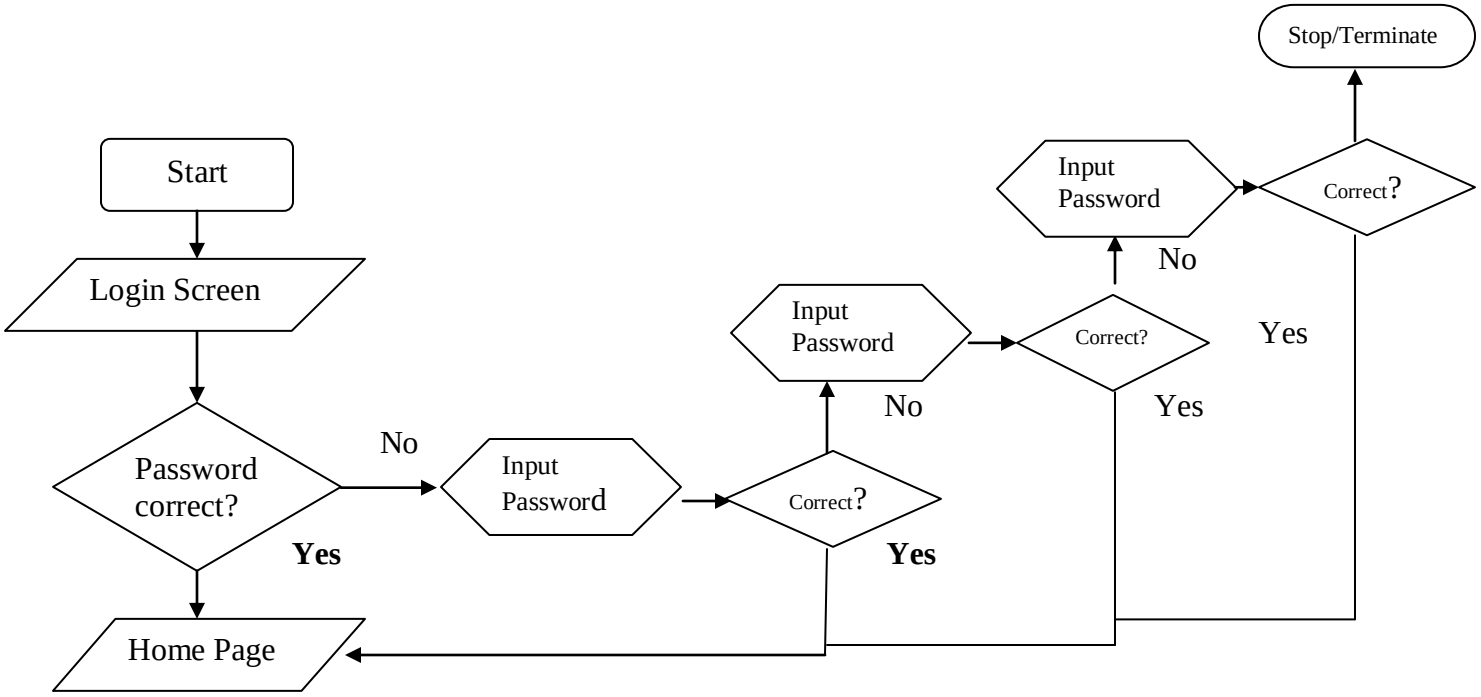


Level 2

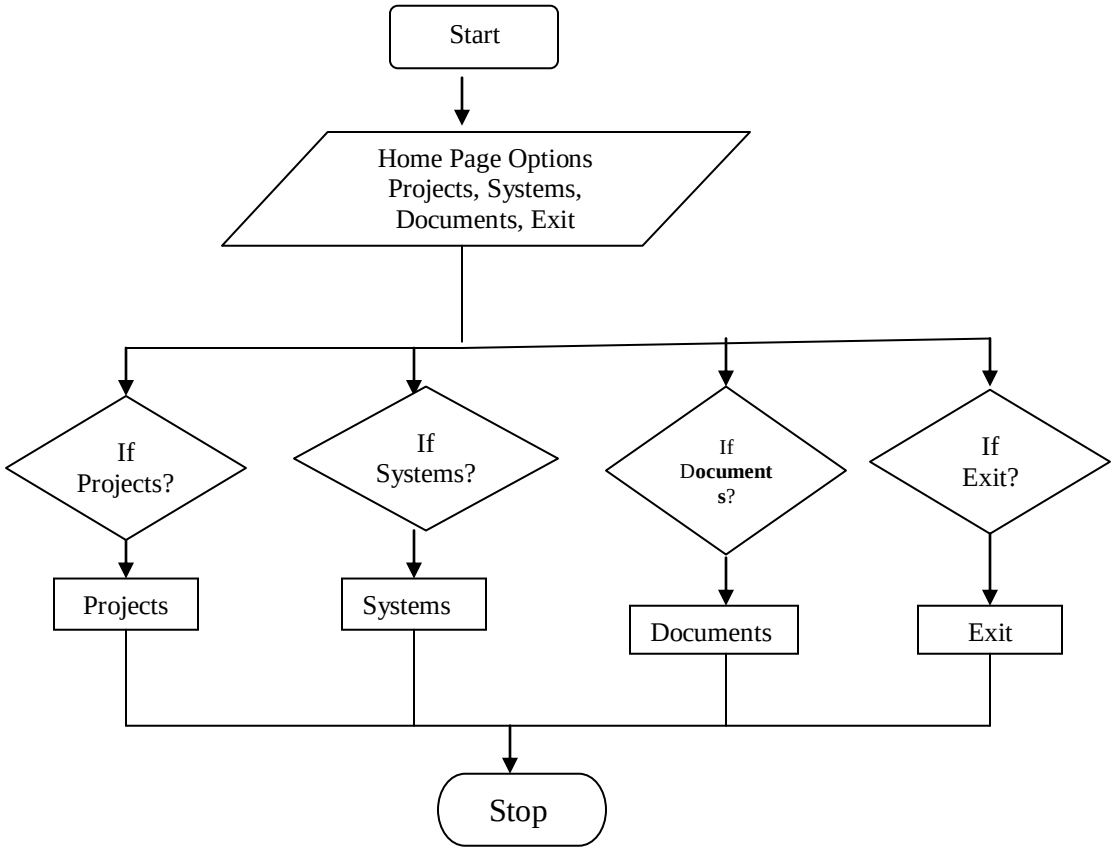

User
Admin
Display Mode
Edit Mode
Login
Option Form
Project
System
Sub Project
Chapters
Add Document Information
Data Store
Search Document Information
Edit Document Information

(5.1) Flow charts

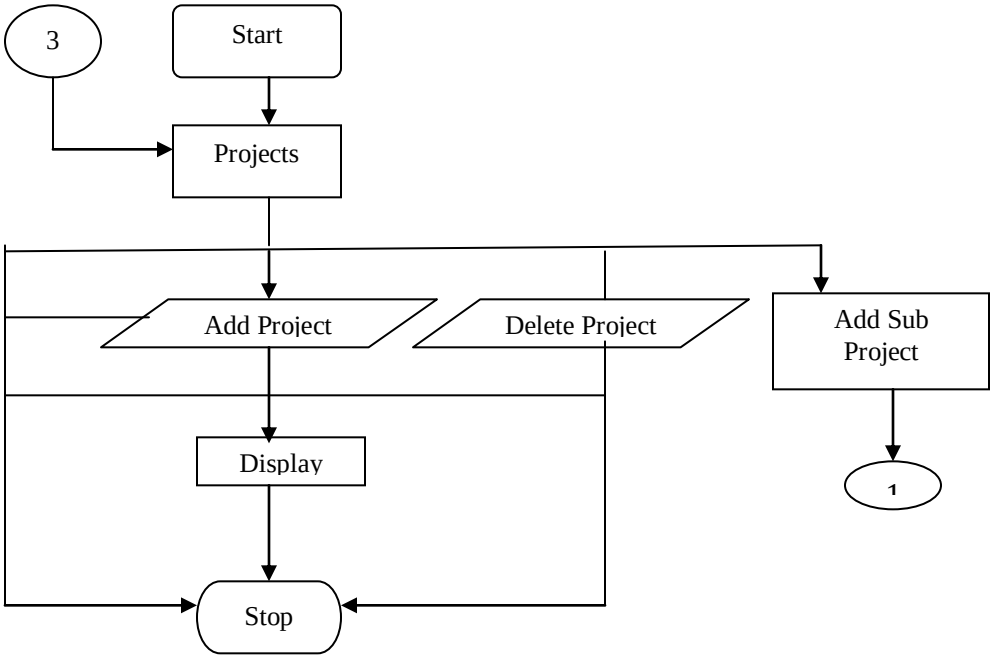
5.1.1) Login Screen:



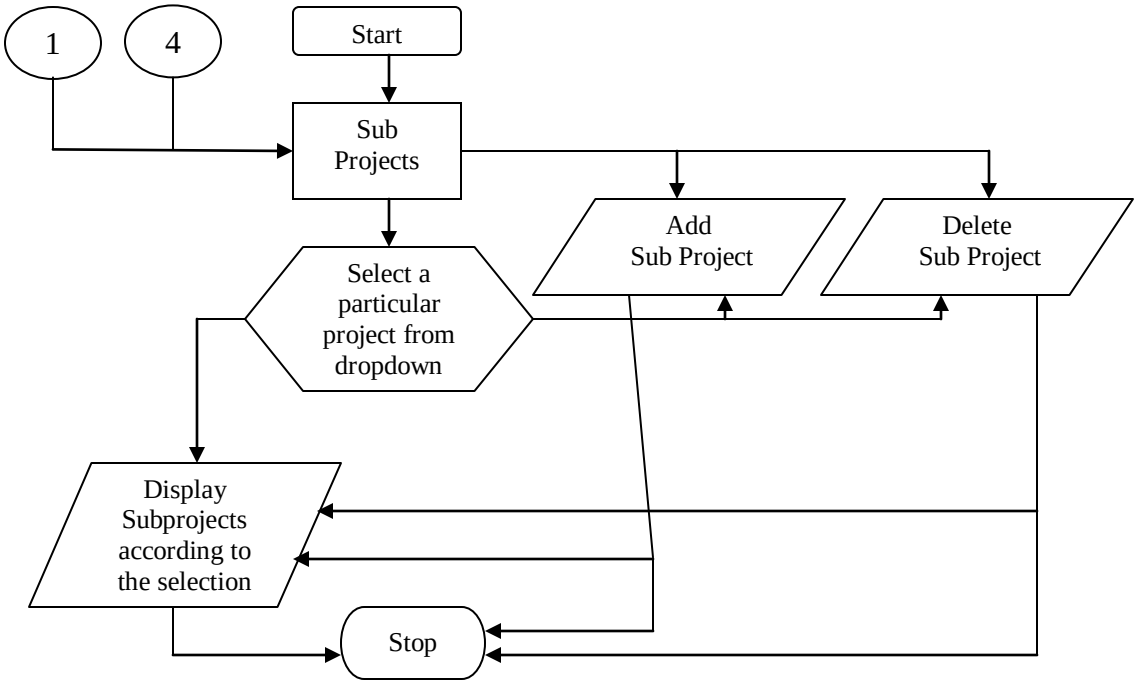
5.1.2) Home Page Screen



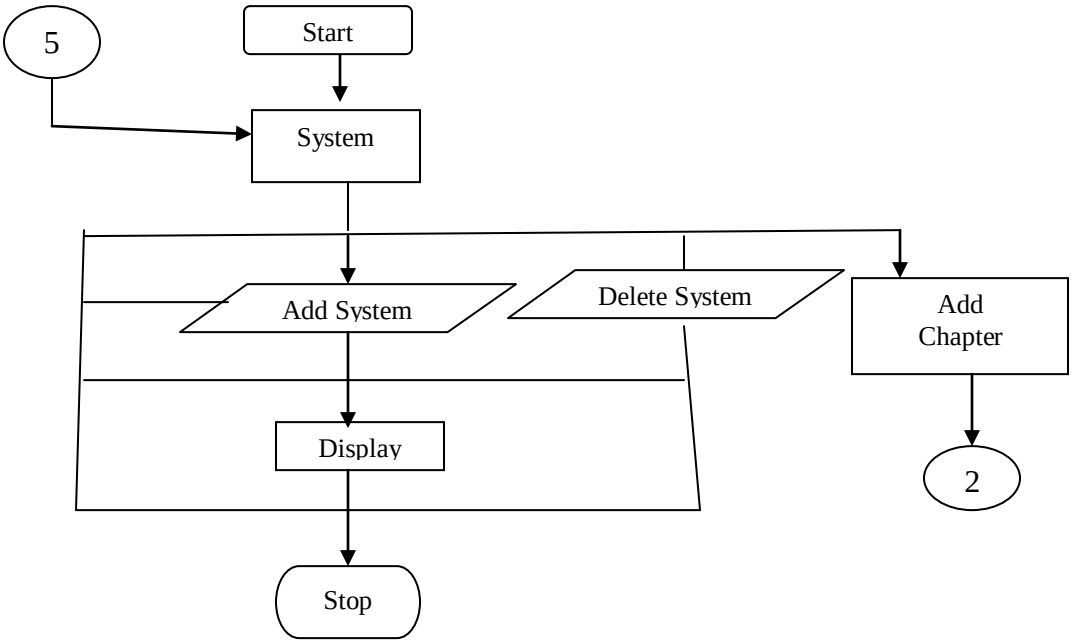
5.1.3) Project Screen:



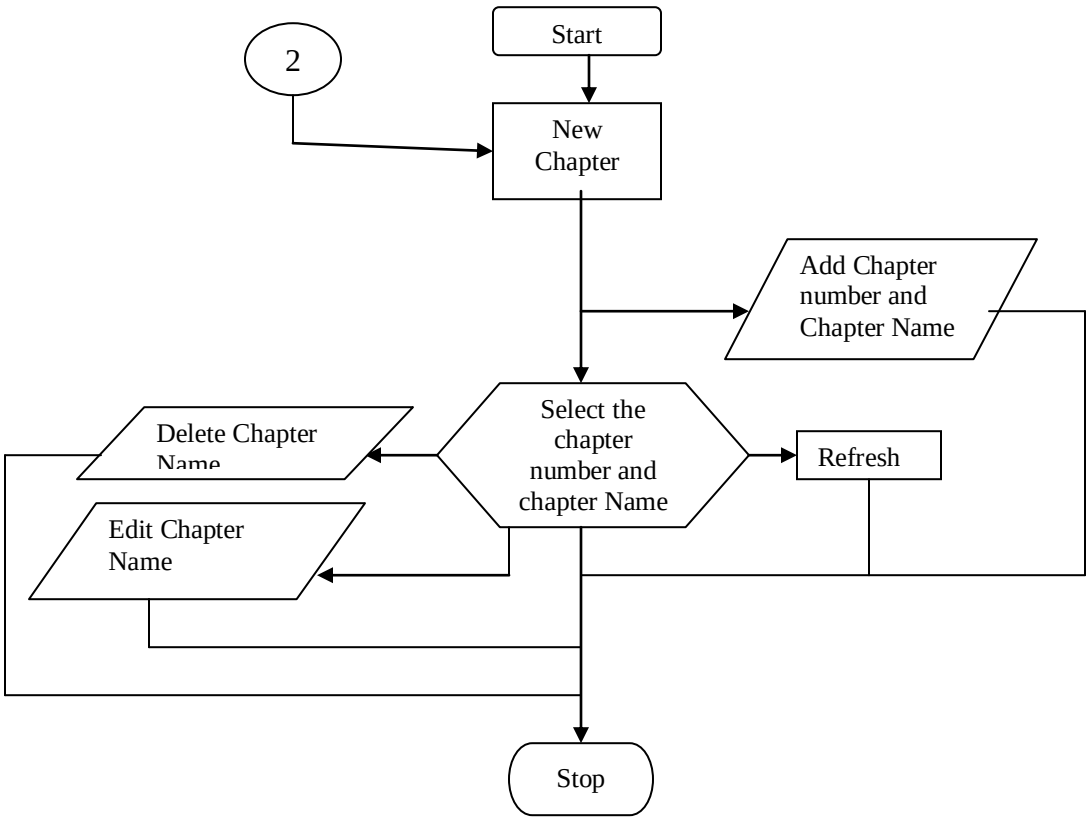
5.1.4) Subproject Screen:



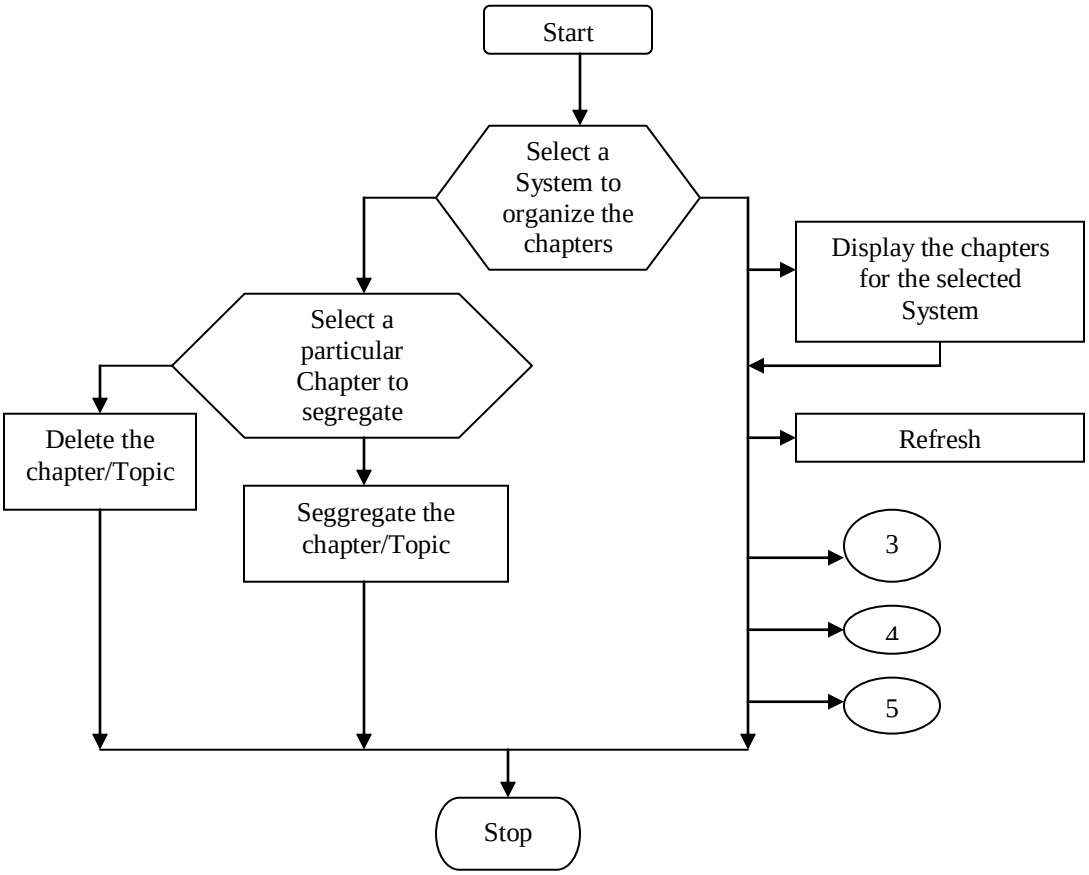
5.1.5) System Screen



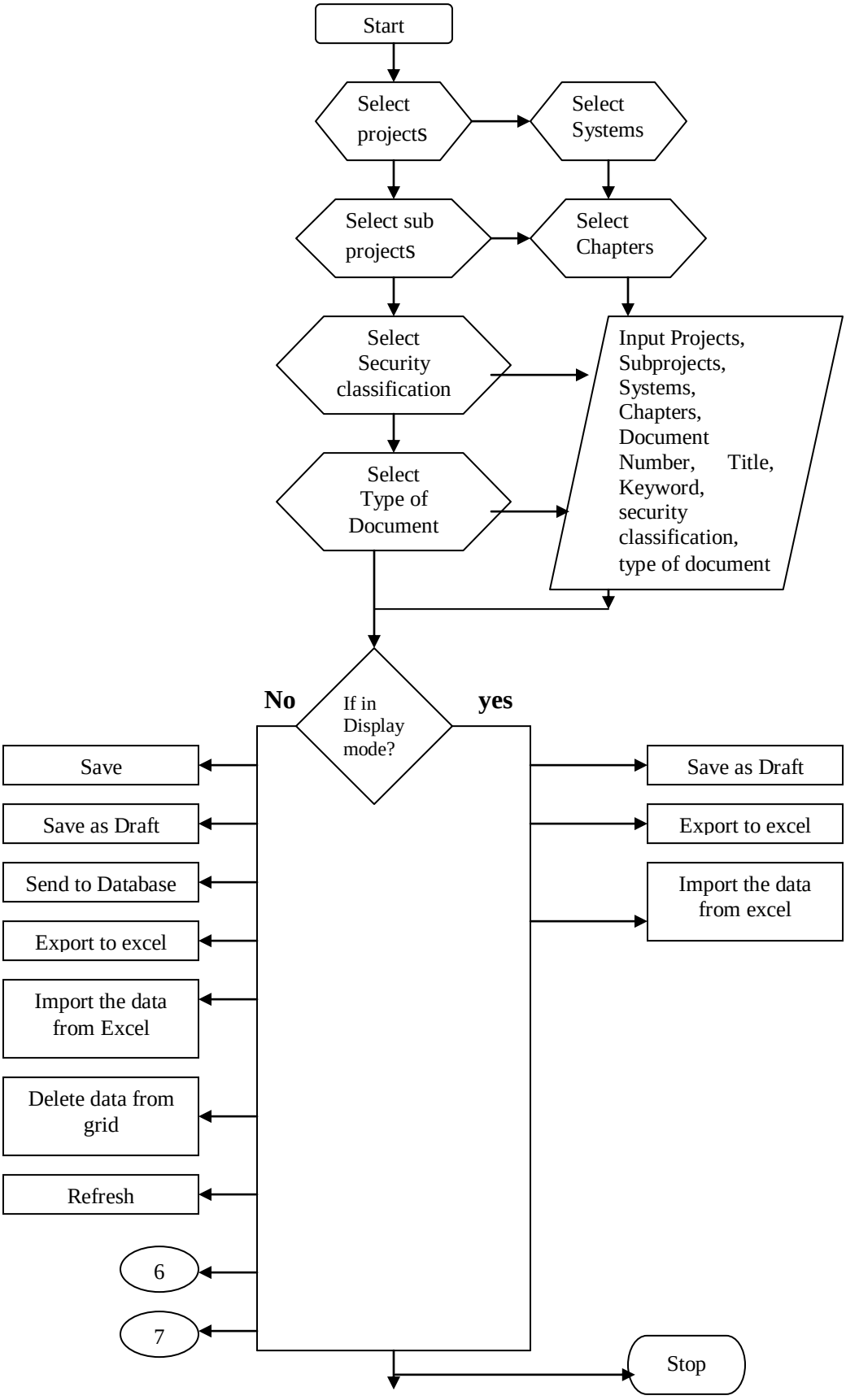
5.1.6) Add New Topic/Chapter Screen



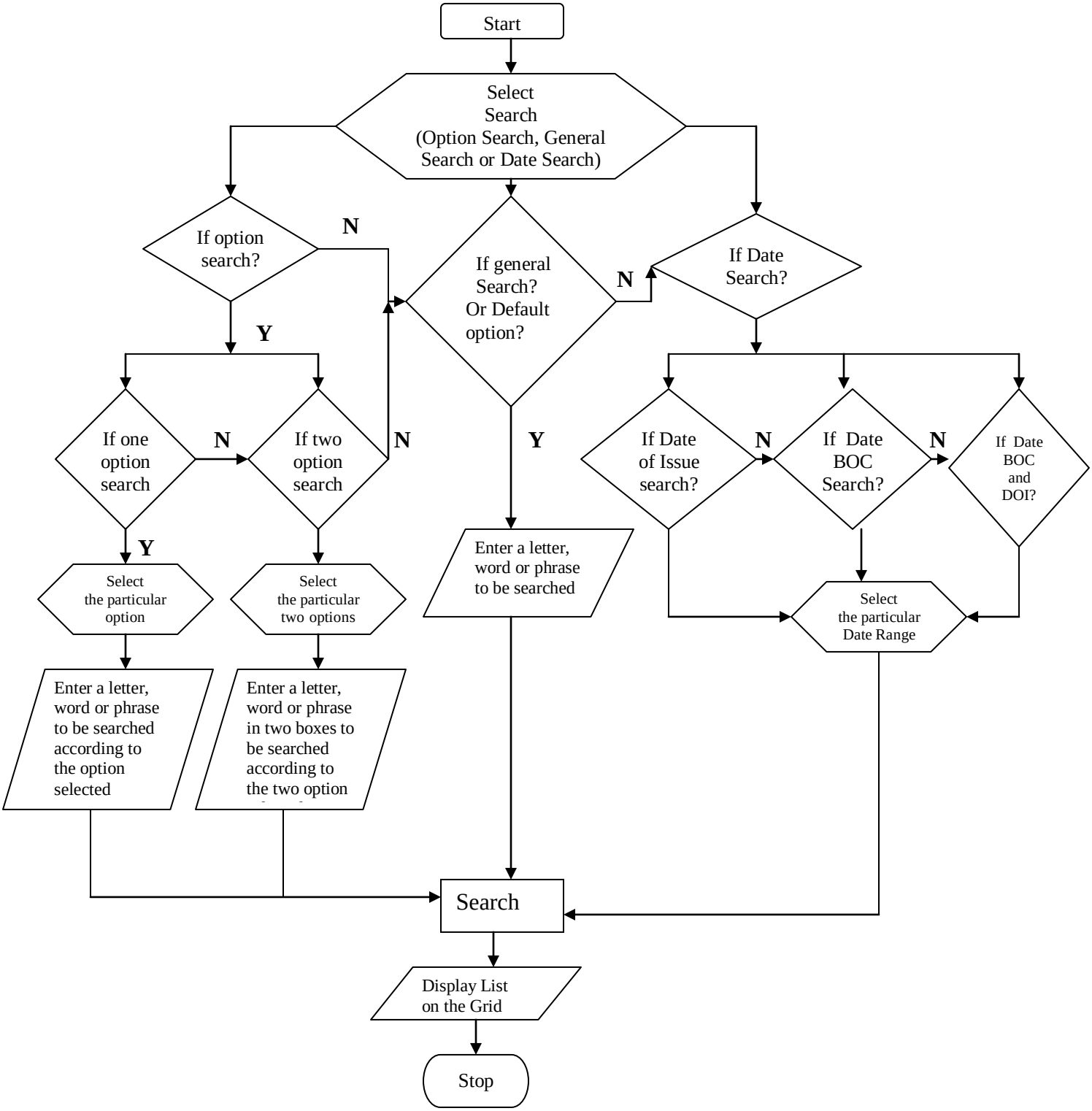
5.1.7) Seggregate Topics/Chapters



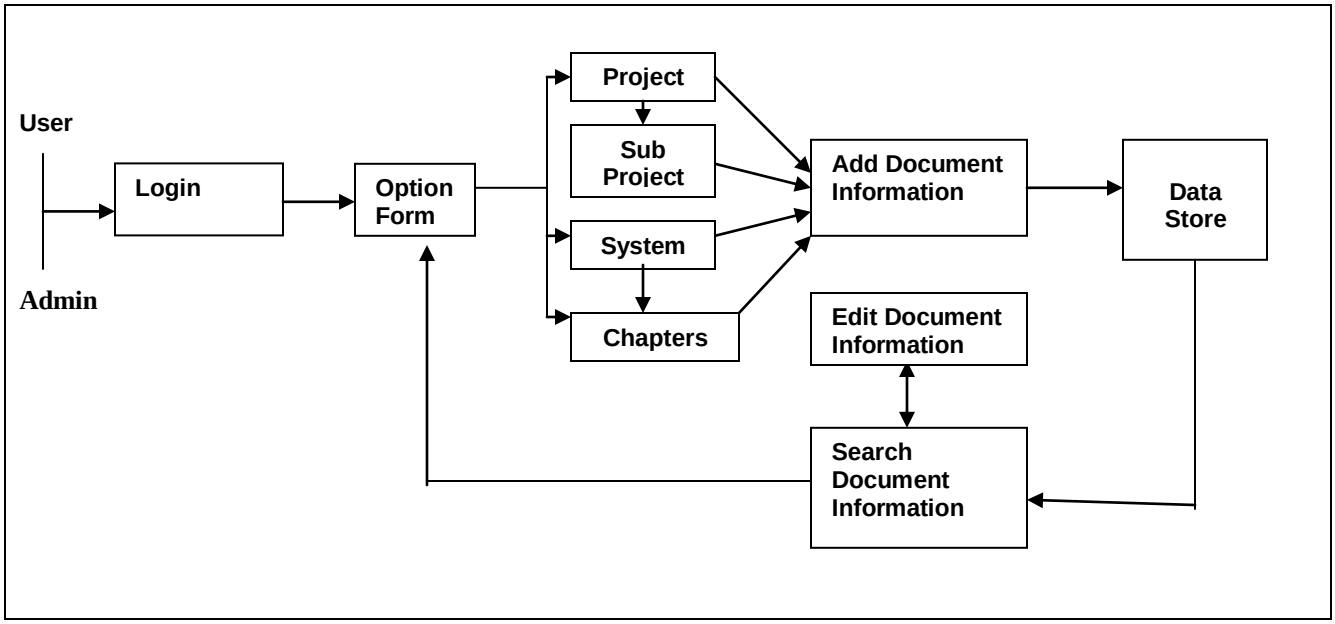
5.1.8) Add New Document



5.1.9) Search Document Form



5.2) Block Diagram



6) Modules of the Project:

Different modules (tree-roots) of this software are:

1. Projects
2. Systems
3. Documents

This project basically starts with a splash screen followed by a Login form.

1. Login form:

Login form is to enter the Home page/Option form of the project. Here the user has three trials to login. If the user fails in all the three attempts, then the software automatically terminates. If succeeded, then it takes the user to the Homepage/Option form.

2. Option Form/Homepage:

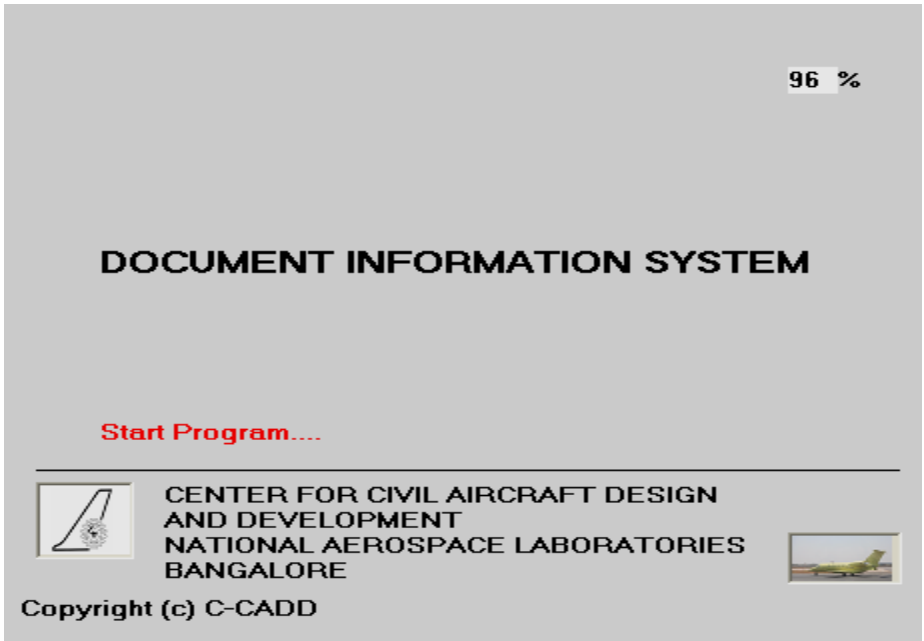
In this form, there are two ways to use the different modules as per user's convenience. The two ways are using menus and using buttons directly for various options.

There are two modes:

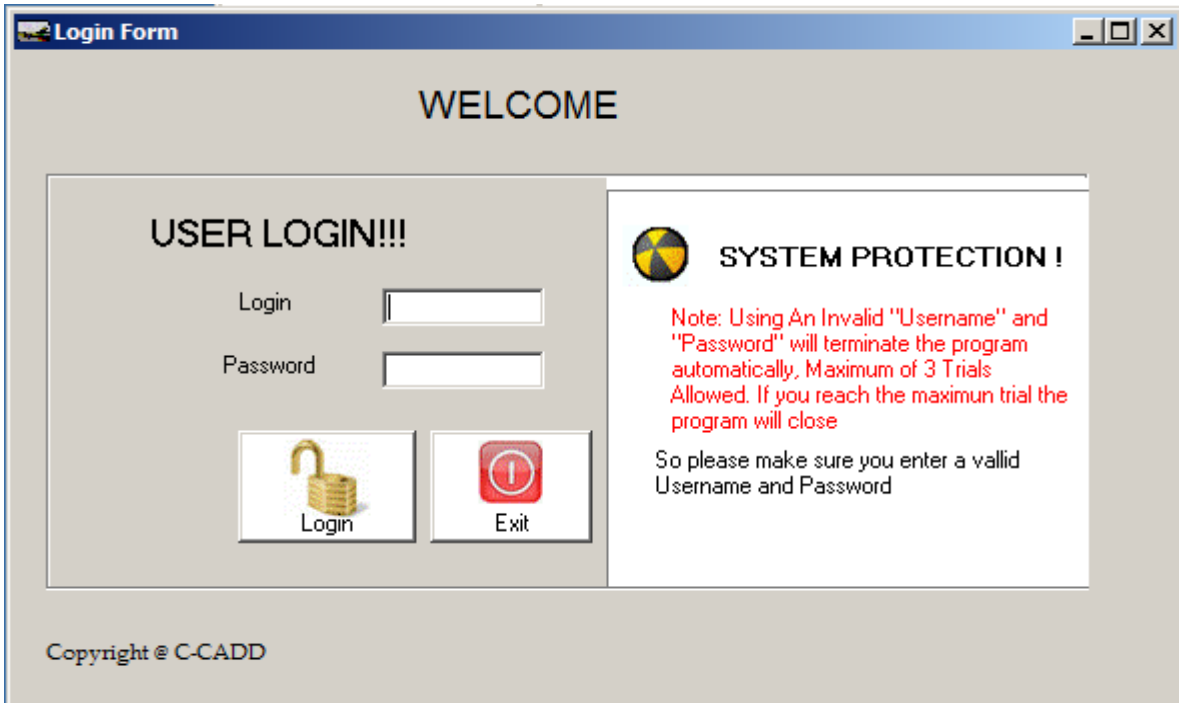
1. Display Mode
2. Edit Mode

Display Mode: This mode is for the general user. In this mode we can only view the bibliographic information which are stored.
Edit Mode: This mode is only for the administrator. Here we can add, delete, edit or view all the information.

SCREEN1: Start up Screen



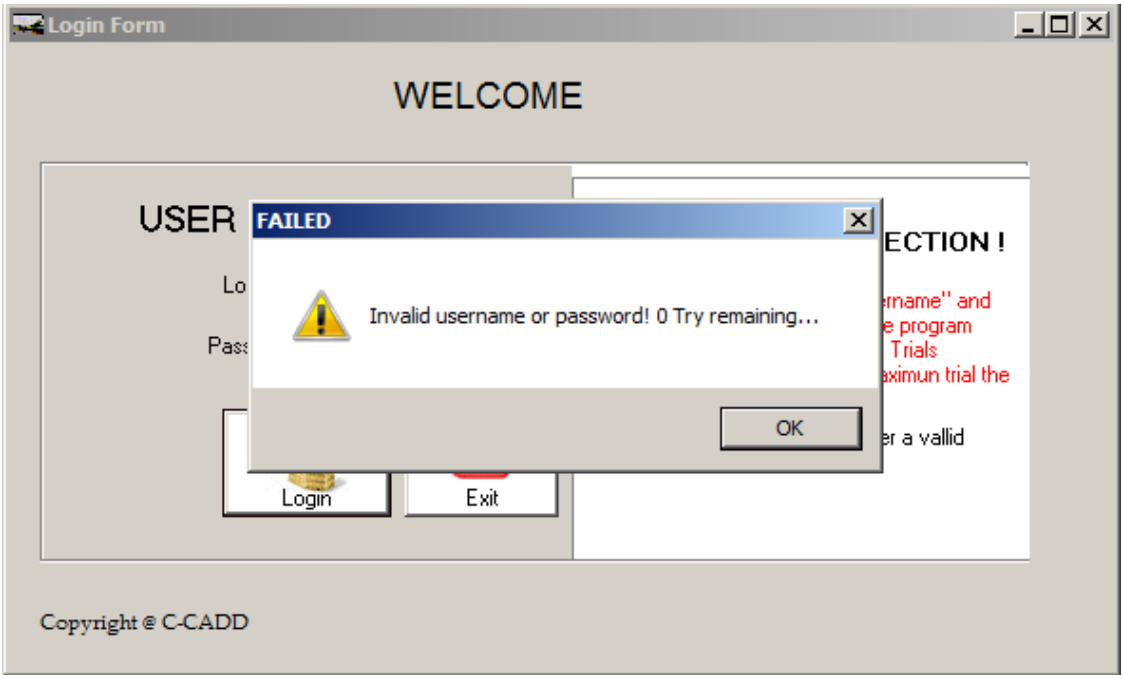
SCREEN2: Login



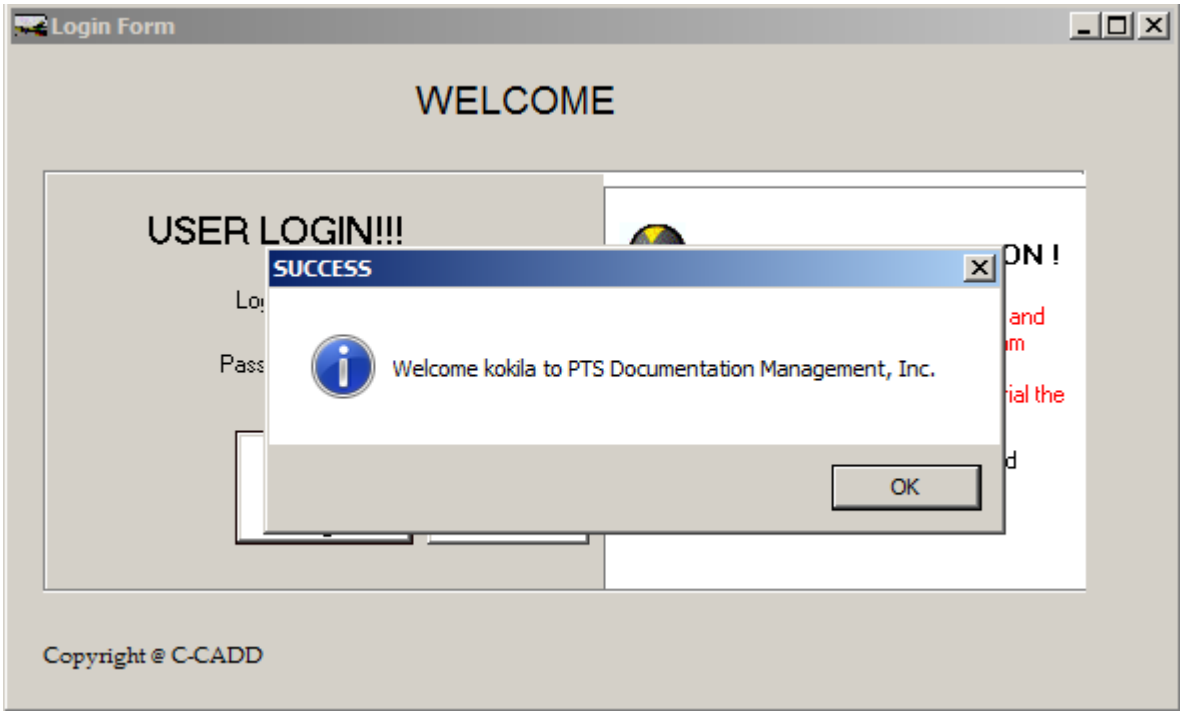
About Login:

If the login name or password is entered incorrect for three times then the software is automatically logged out, otherwise if the login and password is correct within three trials then it takes us to the Homepage/Option screen of the software.

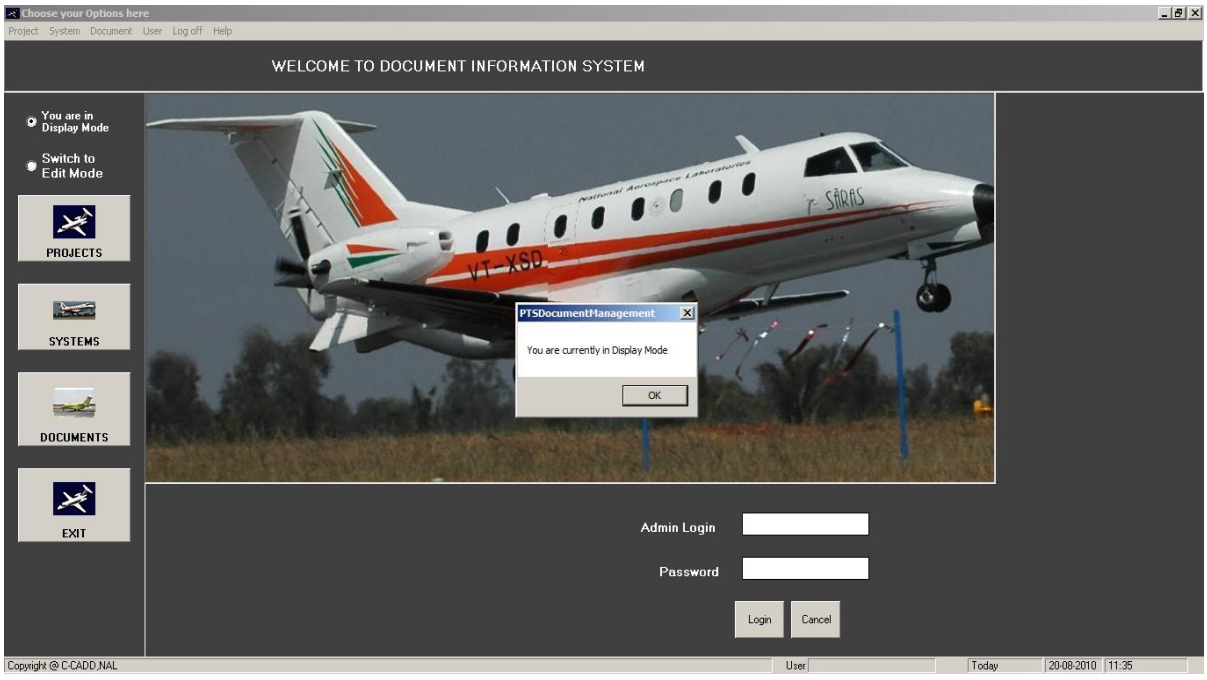
If the login or password is incorrect in any of the three trials, then a Login Failure message is shown as follows.



If the Login and Password, both are correct, within three trials then a Login success message is shown as follows:



SCREEN 3: Homepage/Option Form



Homepage/Option Form:

Once we login correctly in the login screen, then we navigate to Homepage screen and a popup message is shown to confirm that we are in the Display Mode. By default the software is in Display mode.

Basically we have two modes in this software, the Display Mode and the Edit Mode.

- **Display Mode:**

When we are in display mode all the add, edit and delete functionalities which are in all the forms are disabled.In this mode the information of all the forms are displayed.

- **Edit Mode:**

When we are in this mode the information in all the forms can be viewed ,edited,deleted and added.

The Main Modules:

The main modules of this software are:

- Projects
- Systems
- Documents

All the modules in this software can be approached in two ways

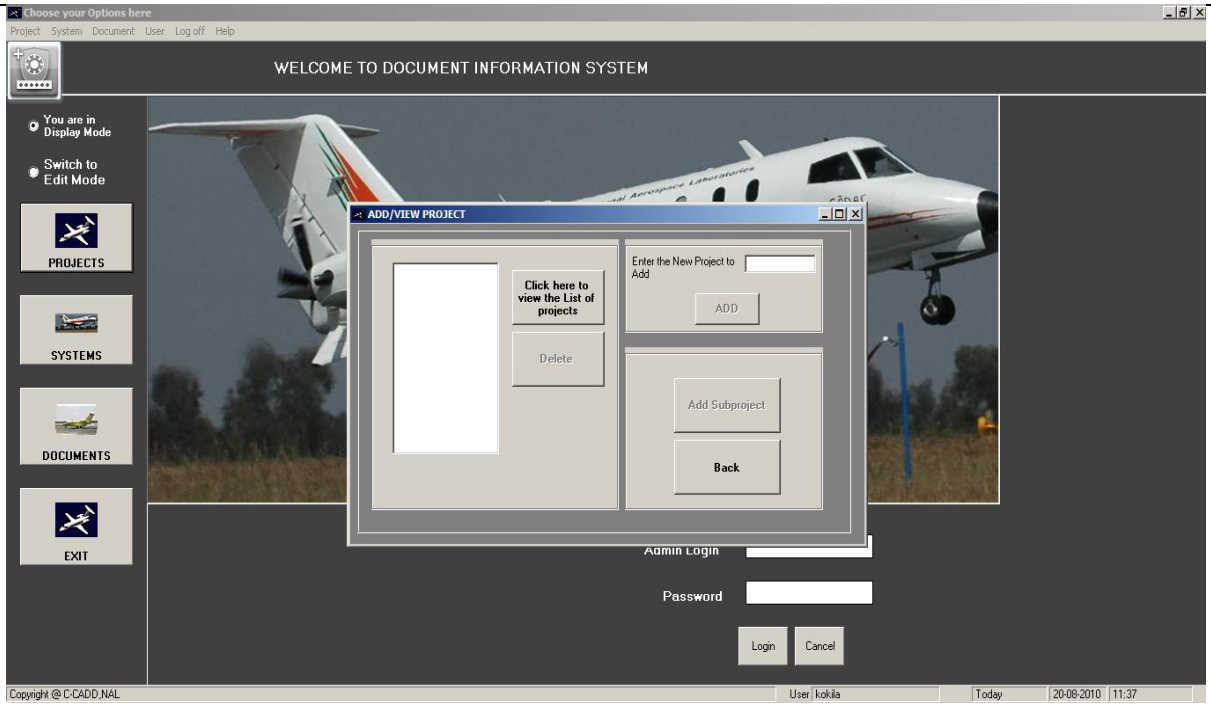
- Menu
- Option Buttons

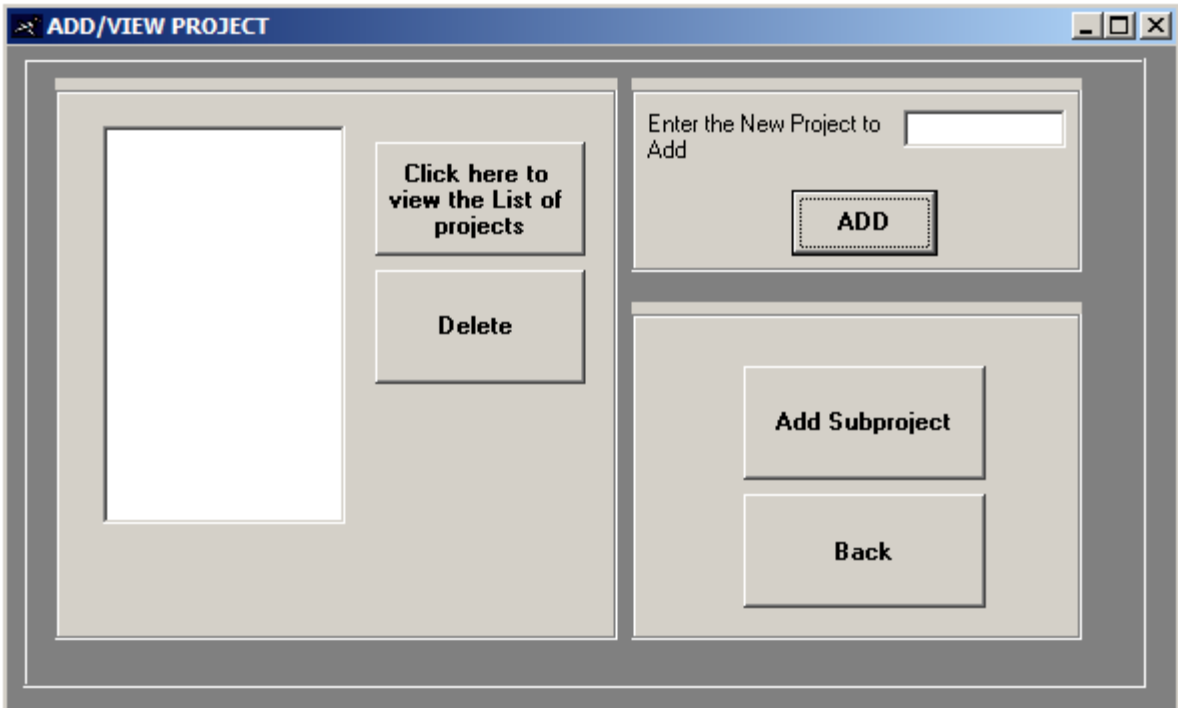
About Modules:

6.1) Projects:

Display Mode:

SCREEN 4: HomePage/Project Form





6.2) Projects And Subprojects:

'Projects' is the major module of the software. The Project Document Information is pertaining to the various projects concerned with Flights. Projects has various subprojects, i.e. each project contains various subprojects. E.g., NM5 PT1 is a sub-ptoject of NM5 project.

'Subprojects' is the sub module for the projects. Each project contains various subprojects. So to a project many subprojects can be added. So the functionalities involved are ADD,DELETE and DISPLAY for projects and subprojects

During Display Mode as specified, all the Addition and Deletion functionalities are disabled. Hence all the existing project list can be viewed.

During Edit Mode as specified, all the Addition and Deletion functionalities are enabled.

6.3) Systems and Chapters:

'Systems' is another module. Examples of systems could be electrical, hydraulic, powerplant etc. Each System can have various chapters.
'Chapters' is the submodule for the System. An examples of chapters could be 'Fuselage'.
In this module there are the following functionalities:

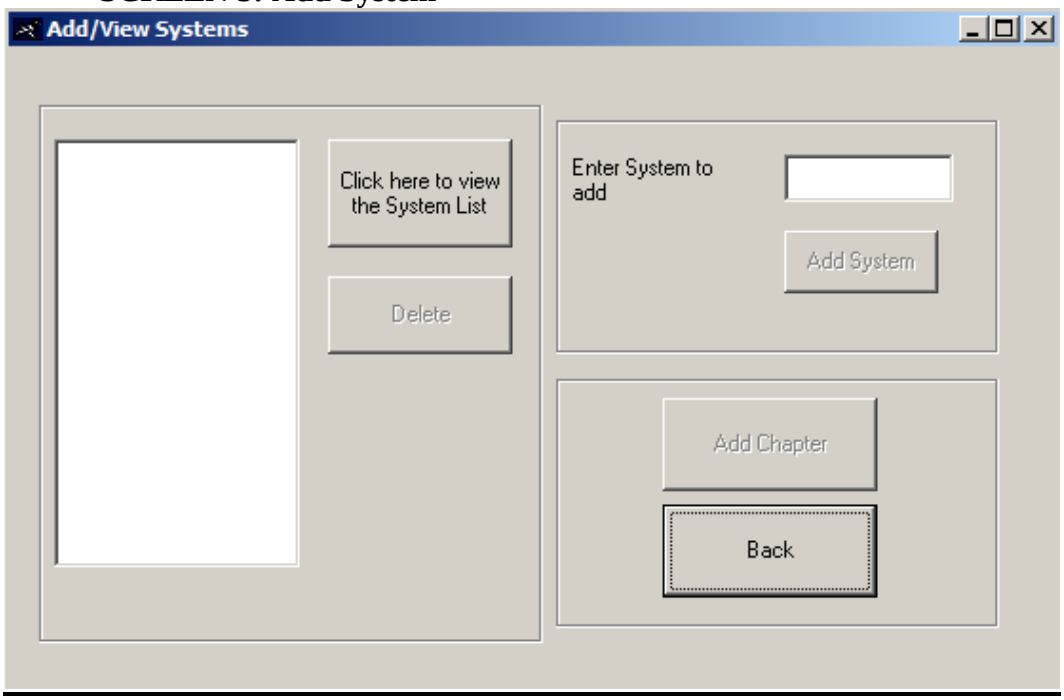
- Adding the systems.
- Deleting the systems
- Adding the chapters .
- Assigning (Segregating) and Unassigning chapters from the Systems.
- Viewing (Display) the Systems and Chapters.

6.3.1) Adding and Deleting the Systems

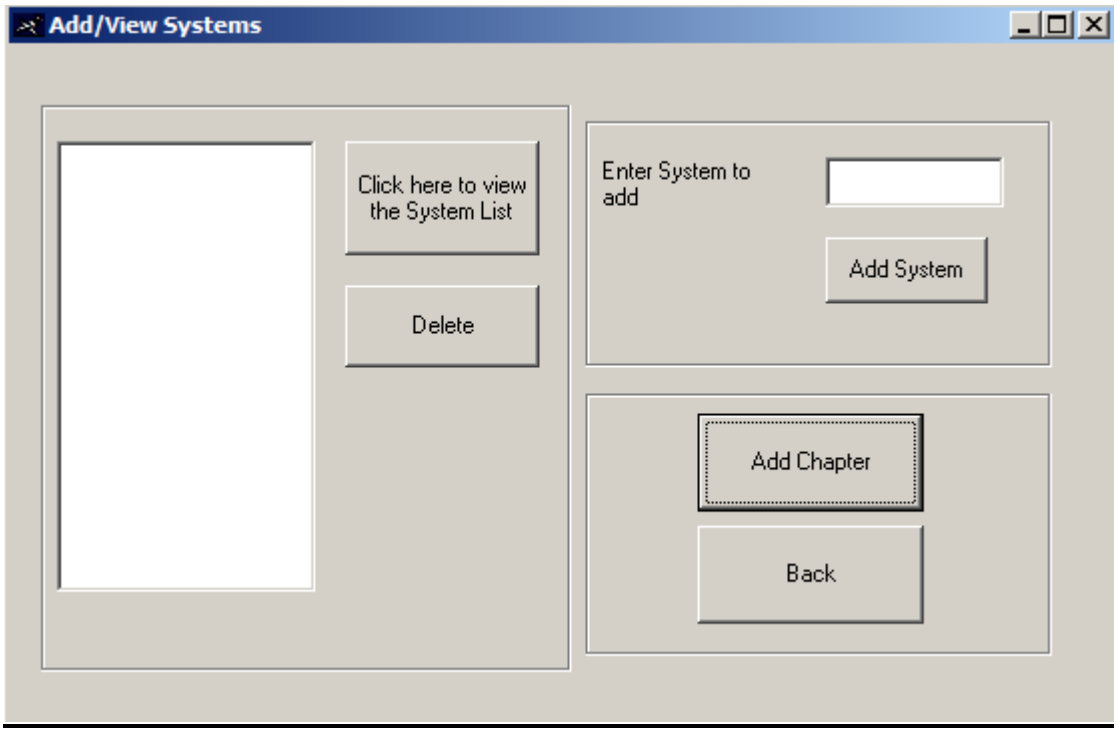
This module is used to add and delete the Systems.This has three options.They are:
ADD, DELETE and DISPLAY (Click here to view the systems), and Add Chapter.

Display Mode:

SCREEN 5: Add System



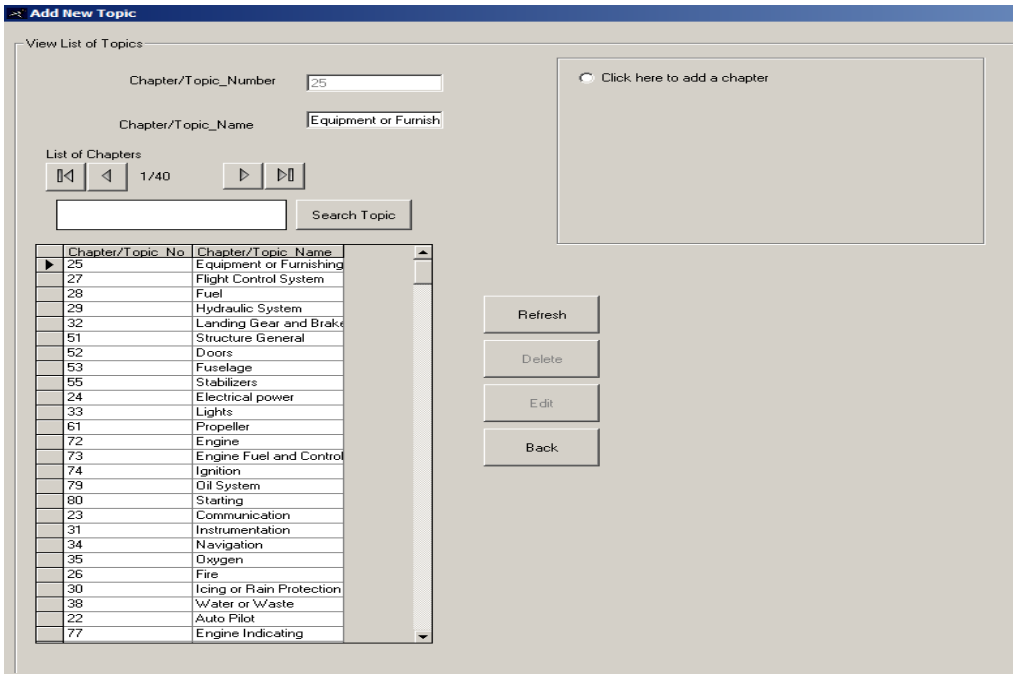
Edit Mode:



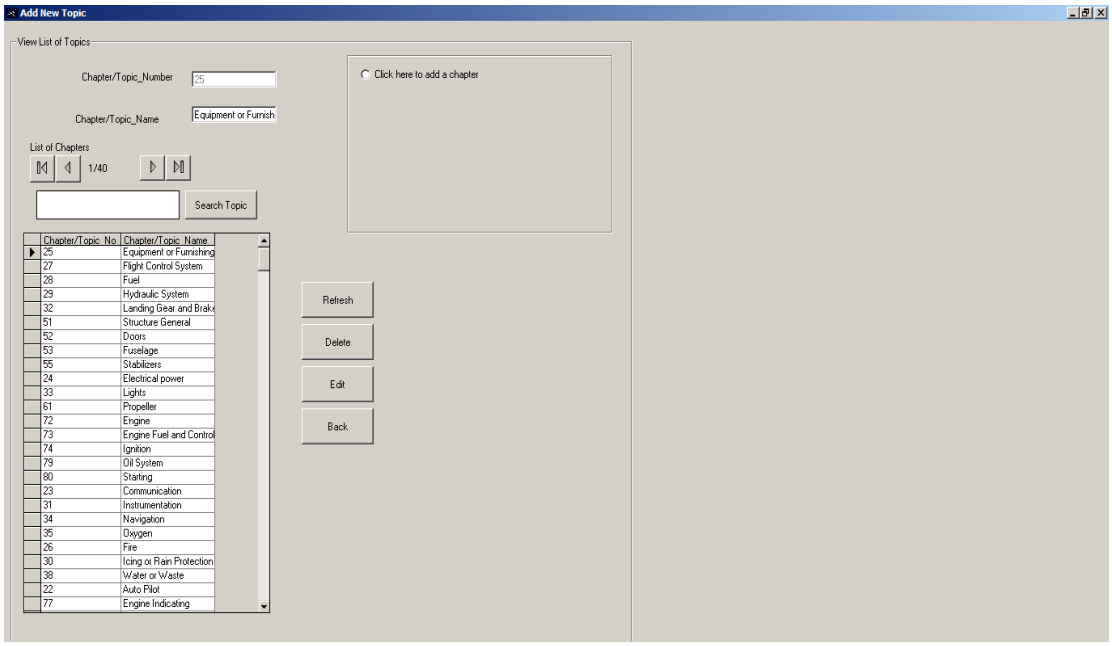
6.3.2) Add New Chapter/Topic

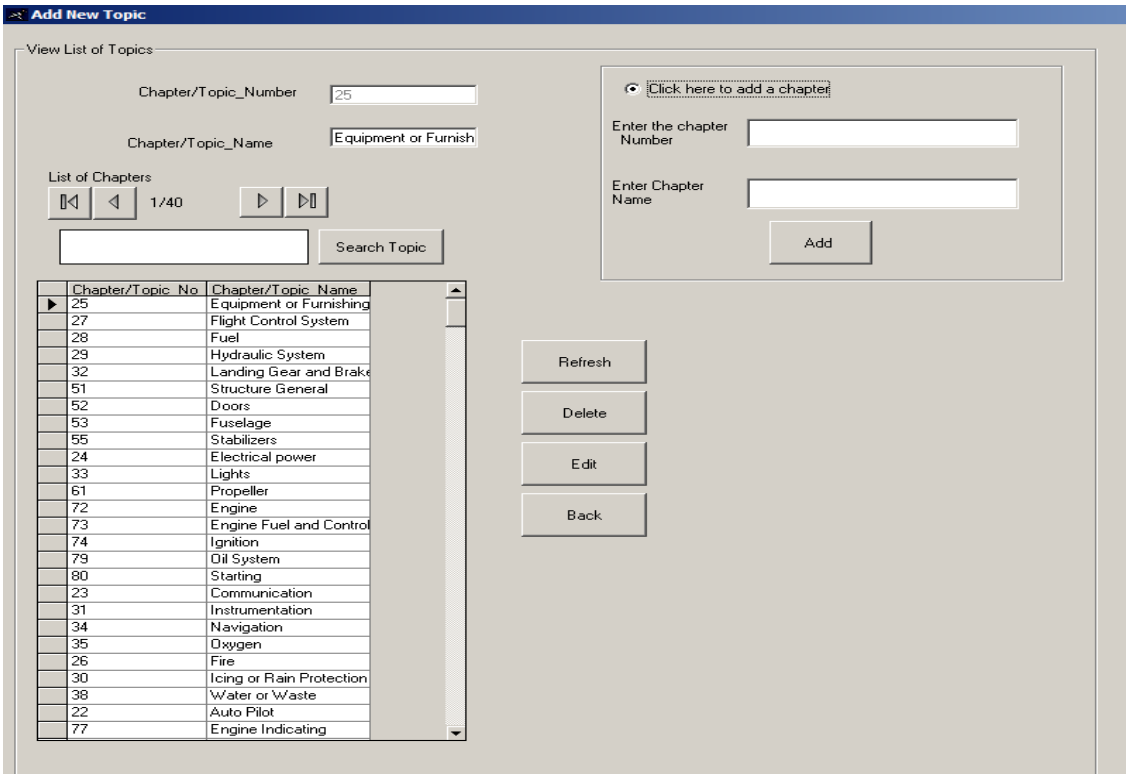
This is screen 6.

DISPLAY MODE:



EDIT MODE:





Add New Chapter/Topic: This screen is for adding new chapters/topics into the database. While adding if the chapter/topic is found in the list, then it is searched and shown on the list, if it is not found, then a message is shown saying ‘Record is not found’ and the chapter number and chapter

name is allowed to be entered, it also prompts if any one field either chapter number/chapter name is left blank, as both the fields are required to be entered.

The options available in this screen are:

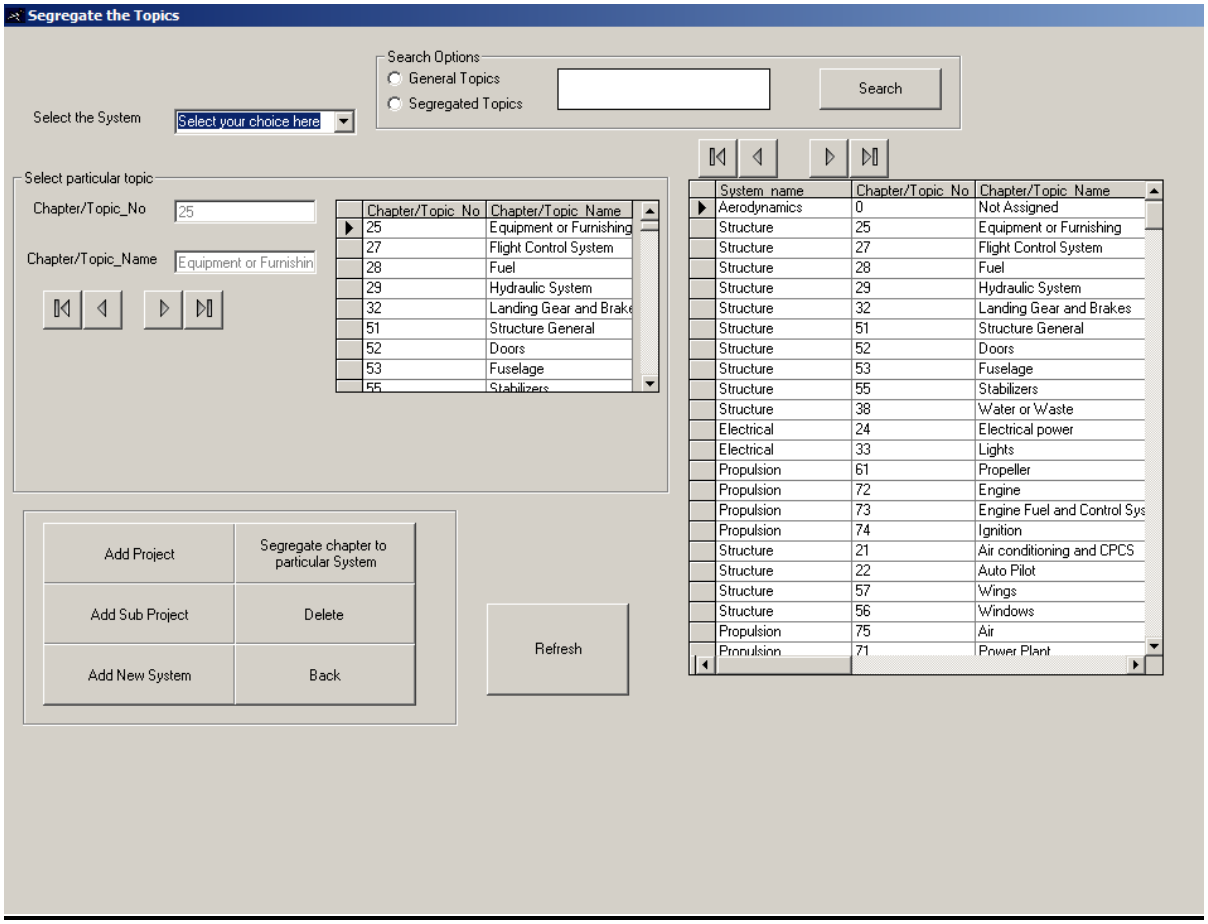
- Add
- Delete
- Edit
- Refresh
- Search Topic

Add: This option is to add a new Topic/chapter
Delete: This option is to delete the topic/chapter
Edit: This option is used to edit the information i.e the existing chapter number or chapter name in the database. The chapter number/Chapter Name can be edited/changed if the chapter name is not assigned to any system, if it is assigned the chapter name or chapter number cannot be edited/changed until the assignment to the system is removed/deleted.
Refresh: This option is used to display all the available Chapters/Topics
Search Topic/Chapter: This option is used to search a particular chapter/topic from a list shown.

6.3.3) Assigning (Segregating) and Unassigning chapters from the Systems.

This is screen 7.

Assigning (Segregating) and Unassigning chapters from the Systems:



This screen is used to assign the various chapters from the general chapter list to various systems. As we can notice in the above screen, we basically have two lists:

- General Chapter List : consists of chapter number and chapter name
- Assigned chapter List: consists of chapter number, chapter name and the system to which the particular chapters are assigned.

In this screen we have major options such as:

- ✓ Segregate chapter to particular system
- ✓ Search
- ✓ Delete
- ✓ Refresh

- Segregate chapter to particular system:
  This option is to segregate/assign various chapters to a particular system as required.

- Search: There are two search options in this form.

  - ✓ General Topics: When we opt for this option and click on search option, we can search the general topics. This searches the list that consists the chapter number and chapter name.

  - ✓ Segregated Topics: When we opt for this option and click on search option, we can search the Segregated/Assigned topic list that consists of chapter number, chapter name and system.

  - ✓ Delete: This option is used to delete/unassign the assigned chapters from the particular systems.

  - ✓ Refresh: This option is to display all the contents available in both the list (General List and Segregated (Assigned) List).

The other navigation options in this form are:

Add Project: “Add Project” screen is shown.

Add Subproject: “Add Subproject” screen is shown.

Add New System: “Add New System” Screen is shown.

6.4) Documents

'Documents' is the third major module in the software. Basically Project Document Information is stored, retrieved and searched using the software. The information fields are specified as above. Under this module there are three major functions. They are:

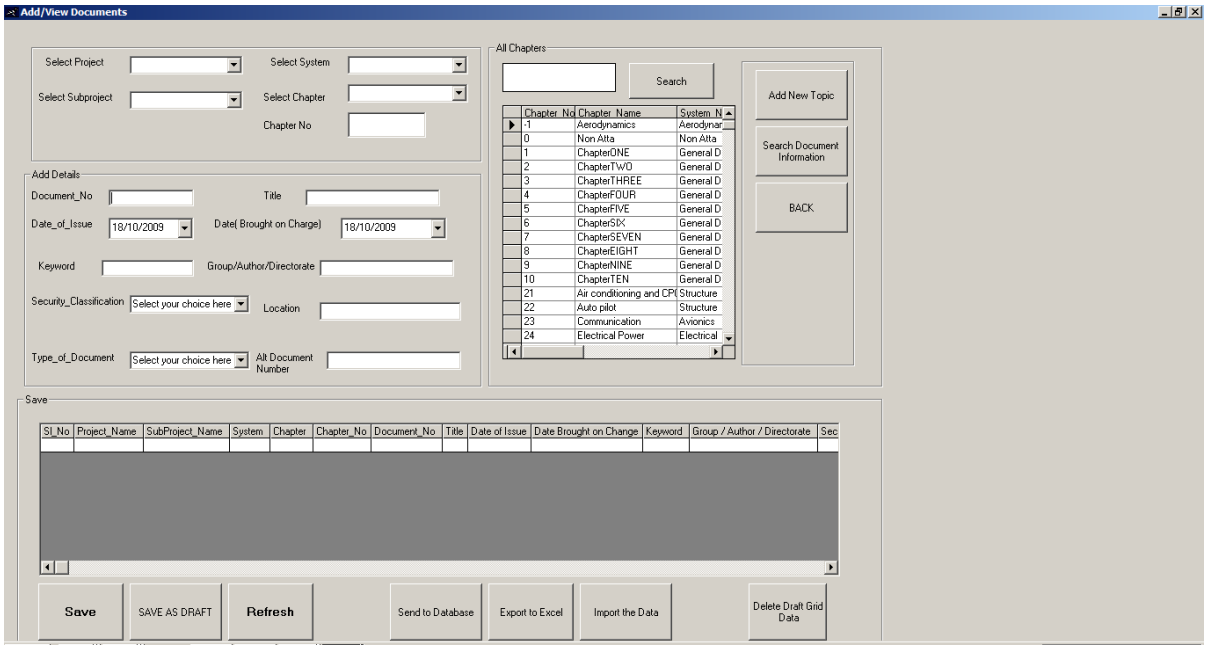
- Add New Document Information
- Search Document Information
- Edit Document Information

All the above functions separately can be considered as the sub modules of 'Documents'

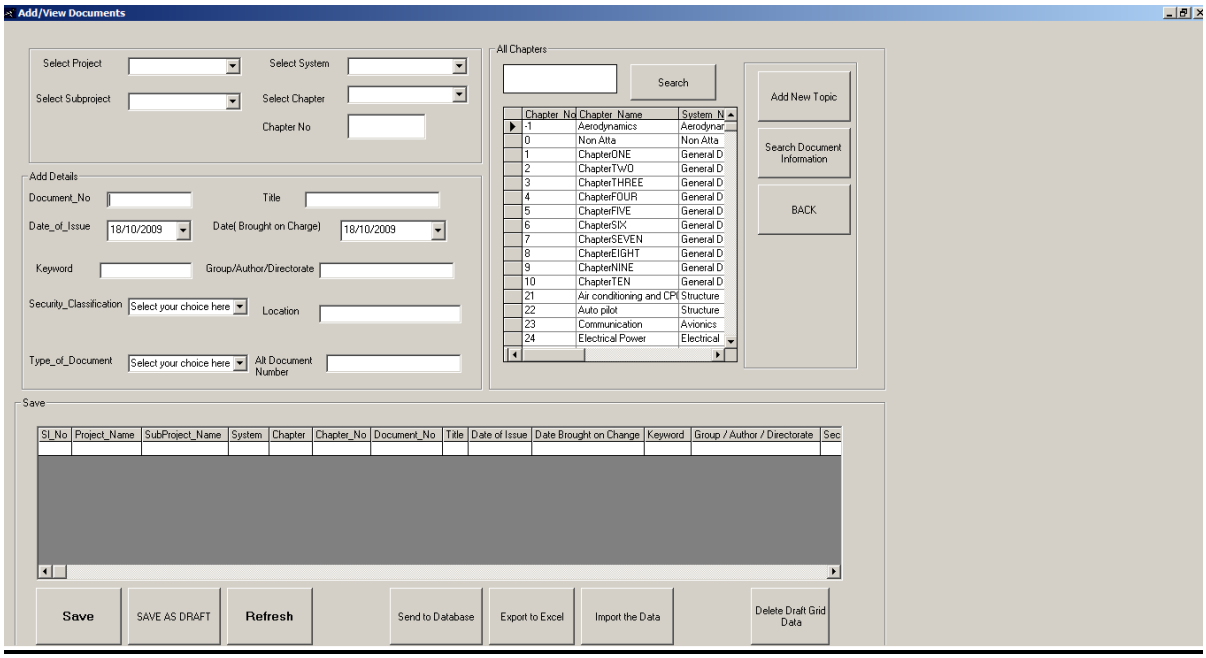
6.4.1) Add New Document Information

SCREEN 5: <u>Add New Document Information Screen:</u>

<u>Display Mode:</u>



Edit Mode:



In this module all the 15 fields can be entered and stored into the database using the 'Save' option in the form. There are so many functionalities other than 'Save' in this option 'Add New Document'. They are:

- Save as Draft
- Delete Draft Grid Data
- Send to Database
- Export to Excel
- Import the Data
- Add New Topic
- Search Document Information

'Save' option

This is the major option to save the Document Information in the database. Once we click on 'Save' it saves/adds all the specified document information in the database and asks whether to save more, if we opt yes, we can add few more document information, where all the document information can be stored into the database.

'Save as Draft'

This option is used to save the document information on the Grid, where many document information can be saved on the grid.

'Delete Draft Grid Data'

This option can be used to delete the document information which is stored on the grid using 'Save as Draft' option.

Send to Database:

This option is used to send the document information which is on the grid into the database.

Export to Excel and import data from excel:

These options are used to export and import the data from an excel sheet to the grid and vice versa.

'Add New Topic' and 'Search Document Information':

These are navigation buttons to Add New Topic and 'Search Document Information' form.

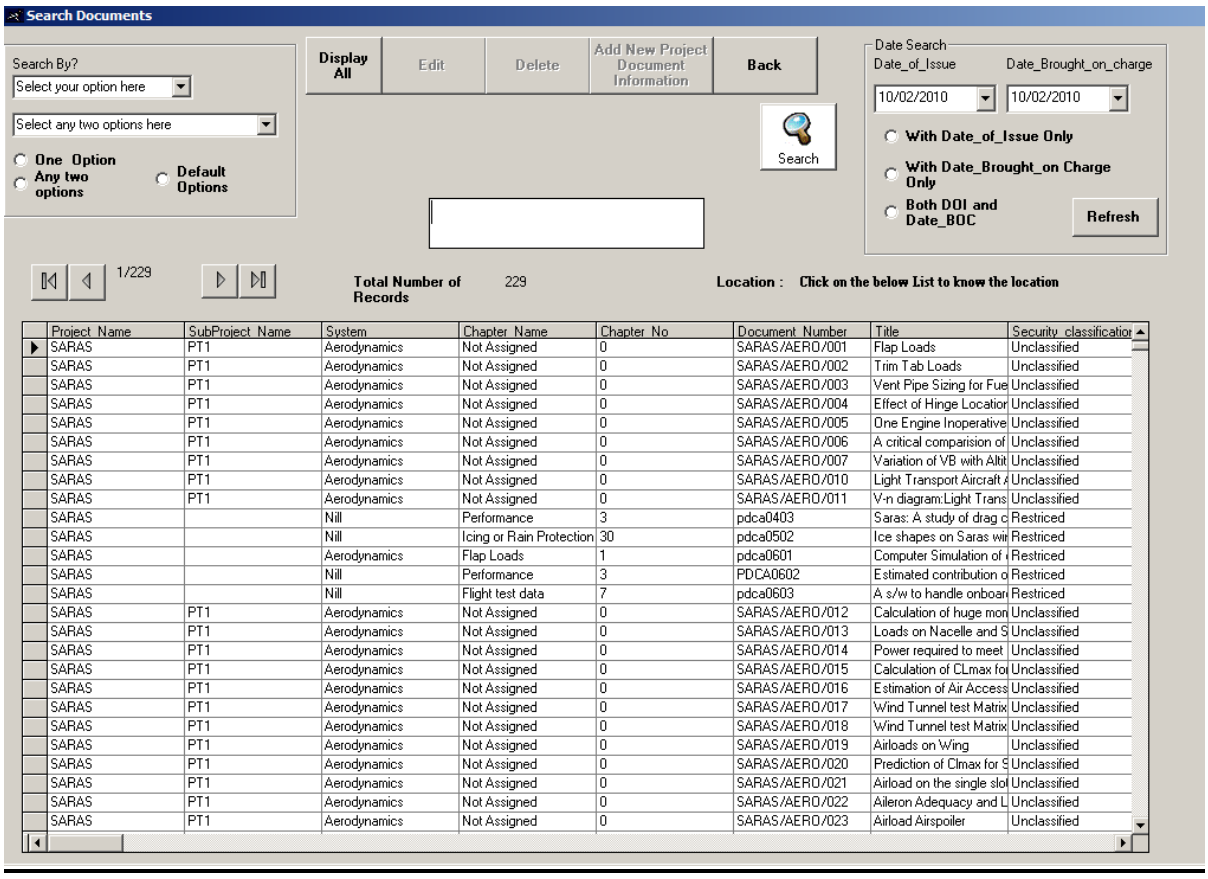
'Search Document Information' Form

This is a navigation button to 'Search Document Information' form.

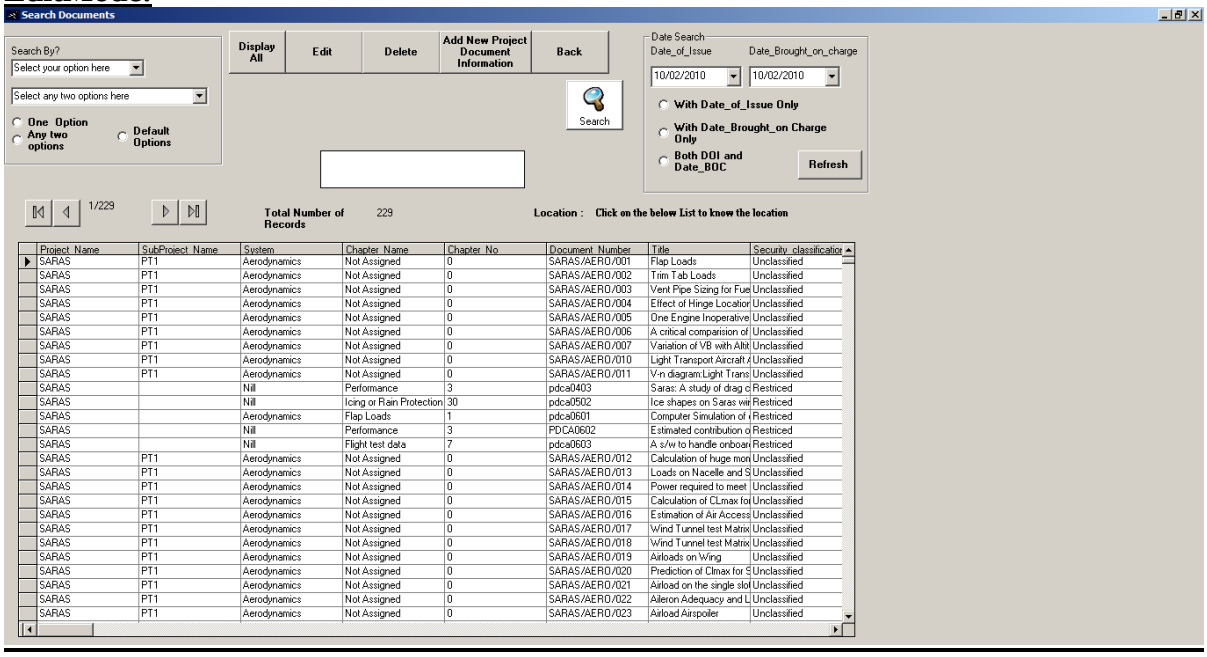
6.4.2) Search Document Information Screen:

SCREEN 6: Search Document Information Screen:

Display Mode:



EditMode:



This module is basically to search the documents which are stored in the database. This module has various functions: Display All, Edit, Delete, and Add New Project Document Information

This module is basically to search the project document information which are stored in the database according to the specified options.

The information can be searched by three options such as one option,searching by any one of the fields,two options,searching using any two fields at a time and default options which contains both one option and two options as shown in the screen.Apart from these options we also have “Date search” where specified date or date range for Date of issue and Date brought on charge can be searched.Here we also have a navigation to Add New Project Document Information screen.We have other options DISPLAY ALL and EDIT, where ‘Display All’ is for displaying all the records and ‘Edit’ is a navigation button for Edit Form.

Edit Document Information Form:

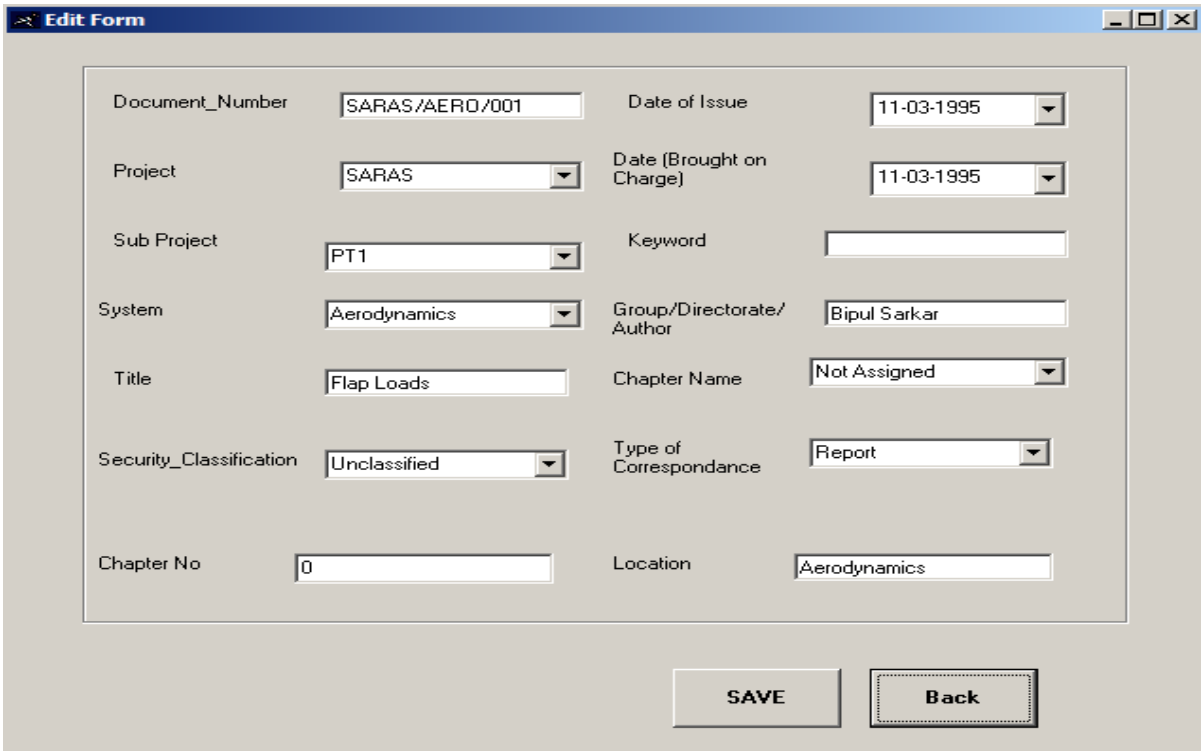
This is basically to edit the document information. All the information on the ‘Edit Form’ is retrieved from the grid of the search form to a separate edit form.

This module is basically to edit the existing project document information which is stored in the database according to the specified options.

The information can be edited whenever the document is searched. There is an EDIT option for editig the document information both in the search module as well as separately under the Document Menu on the Homepage.Please note that only the existing information of the major fields such as Projects, Subprojects, Systems,Chapter Name, Chapter Number, Security classification and Type of

the document can be edited and rest of the information can be edited as required but in the specified format only.

SCREEN 7: Edit Form

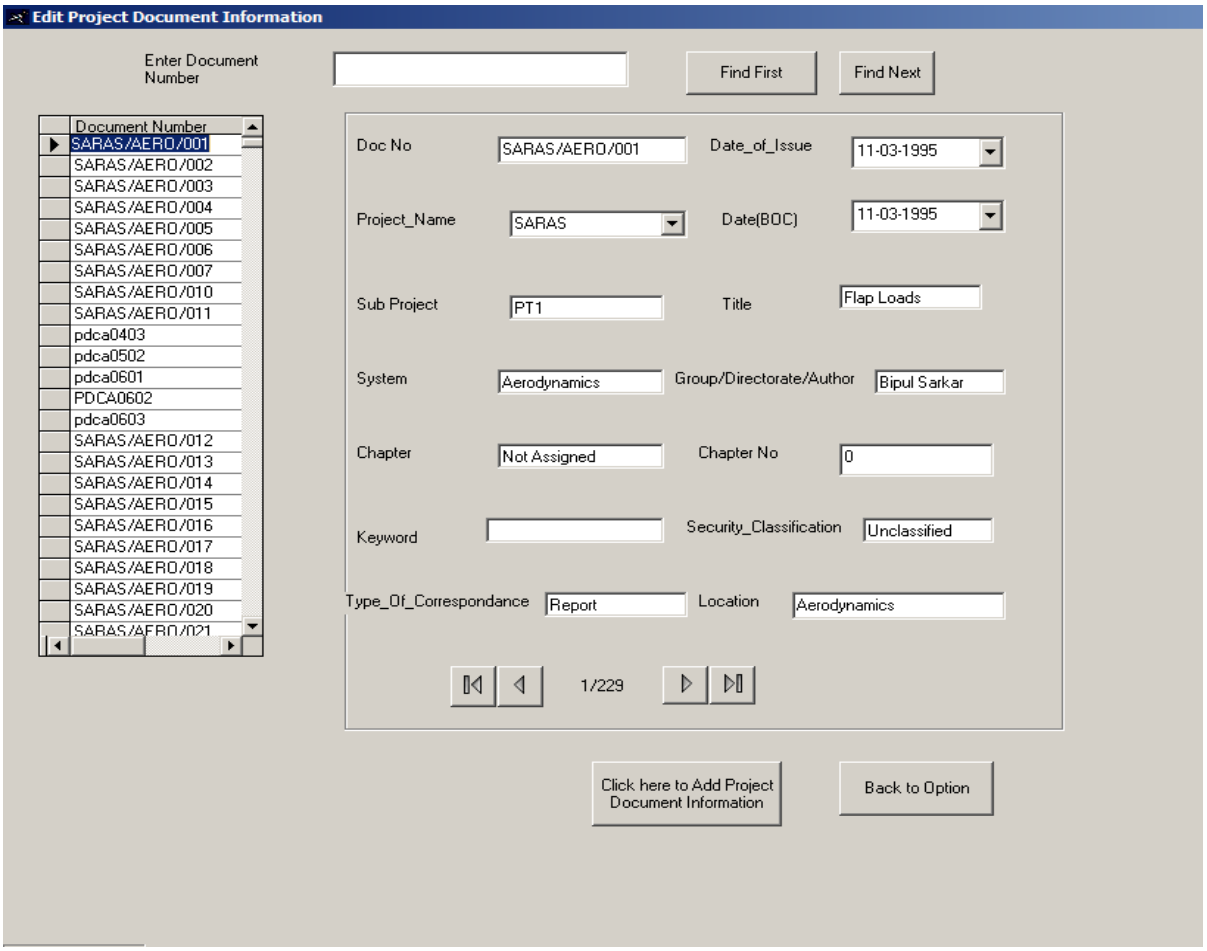


In this edit form, which is viewed from the Search form.The row which is highlighted in the search form, the whole row information is reflected in the Edit form, here we can edit/change the information

in this form. The 'SAVE' option in this form will save/update the changed information in the screen and will automatically get back to the Search Form. This is similar to all the document information available in the 'Search Form'.

Edit Document Form can have two forms.

- One edit form is approached from the Search form as shown above.
- One more edit form can be selected from the Menu in the option form.This form can be shown as follows:



Here in this form there is a navigation to Add Project Document Form.

7) Software Requirement Specification

PURPOSE:

The main purpose of the project is to maintain the document information of various projects, so that it will be easy for adding, searching, modifying and deleting the specific information. The main feature of this software is the search form, where it has multiple options for searching along with the General search option.

PROBLEM STATEMENT:

The software basically aims at maintaining the project document information of various flights.

SCOPE:

The project has the following features:

- Adding the document information
- Deleting the document information
- Editing the document information
- Searching the document information with several options.

DEFINITIONS:

Before adding the project document information, it is necessary to add the main information such as project, sub project, system and chapters. Sub projects option is not mandatory .Once these main information is stored, the rest of the specified information for a Project Document Information are:

- Document Number: This is a unique identification number for each document. The naming convention here can be alphanumeric. This field is mandatory.

- Title: This forms the heading or the title for each document. Every document should have a title and hence this field is mandatory. The naming convention here is only alphabets.

- Keyword: In every document, there might be some important words

- Date_of_Issue: This is the date, when the document becomes issued. The format is in dd/mm/yyyy.

- Date_Brought_on_Charge: This is the date whenever the document is modified from the time it is issued.

- Security_Classification: Each and every document is released with a certain security level. Here there are some set of security levels defined. They are Unclassified, Restricted, Top Secret, Secret and Confidential.

- Type_of_Correspondance: This option describes the type of the document. Here the pre defined types of documents specified are Report, Letter, Publication, Email, and Specification, Minutes of meeting and Flight Data.

- Author/Group/Directorate: This field specifies the author of the document, or the group of authors responsible for the document.

- Location: This field represents Division or Name of the group where the document is available.

8) System design

This software is basically a database project where all the information is stored into a database in the form of Tables. So the software "Document Information System" is internally designed in the form of tables and the information is retrieved and displayed on forms. Therefore the input design for system is the Database Design and the Output Design is the Graphical User Interface (GUI) of the system which shows the way in which the information is stored and retrieved.

DATABASE DESIGN:

Admin_Login

Field_Name	Data type	Description
Admin_Name	Text	Stores the name of the Administrator
Admin_Password	Text	Stores the password

Login_Table

Field_Name	Data type	Description
Login_Name(PK)*	Text	Stores the names of the Users who can only view the document information. They cannot edit the information.
Password	Text	Stores the password of Users
Account_Type	Text	Type of the account is specified.

Project_List

Field_Name	Data type	Description
Project_Id	Auto number	This number is automatically generated whenever the project name or record is added.
Project_Name (PK) *	Text	Stores the name of the project

Subproject_List

Field_Name	Data type	Description
Project_Id	Auto number	This number is automatically generated whenever the project name or record is added.
Project_Name (FK) *	Text	Stores the name of the project which is same as project name in Project_List Table.
Subproject_Id	Number	Stores the number of the sub project which gets incremented
Subproject_Name	Text	Stores the name of the subproject

*PK: Primary Key
*FK: Foriegn Key

System_List

Field_Name	Data type	Description
System_Id	Auto number	This number is automatically generated whenever the system name or record is added.
System_Name (PK) *	Text	Stores the name of the System

General_Topics

Field_Name	Data type	Description
Topic_No	Auto number	This number is automatically generated whenever the system name or record is added.
Chapter_No	Number	Stores the number of the chapter which gets incremented
Chapter_Name(PK) *	Text	Stores the name of the Chapter

Topic

Field_Name	Data type	Description
System_Id	Auto number	This number is automatically generated whenever the system name or record is added.
System_Name(FK)	Text	Stores the name of the System which is same as in System_List Table.
Chapter No	Number	Stores the number of the chapter which gets incremented
Chapter_Name(FK) *	Text	Stores the name of the Chapter that is the same name as in General_Topics table.

Security_Classification

Field_Name	Data type	Description
Security_Id (PK) *	Number	Stores the number of the Security_Classification which gets incremented whenever new one is added.
Security_Name	Text	Stores the name of the Security Classification.

Type_of_Correspondance

Field_Name	Data type	Description
TOC_Id	Number	Stores the number of the Security_Classification which gets incremented whenever new one is added.
Type_of_Correspondance	Text	Stores the name of the Type of correspondane

*PK: Primary Key
*FK: Foreign Key

Project_Document_Info

Field_Name	Data type	Description
Project_Name (FK) *	Text	Stores the name of the project which is same as project name in Project_List Table.
SubProject_Name(FK)*	Text	Stores the name of the subproject which is same as sub project name in Subproject_List Table.
System(FK)*	Text	Stores the name of the System which is same as in System_List Table.
Chapter_Name(FK) *	Text	Stores the name of the Chapter that is the same name as in General_Topics table.
Chapter No	Number	Stores the number of the chapter which gets incremented
Document_Number	Text	Stores the Document Number for a particular document.
Title	Text	Stores the title name of a particular document
Security_Classification	Text	Stores the name of the security classification for a particular document. This information is retrieved from the Security_Classification table.
Keyword	Text	Stores the Keyword name of a particular document
DOI	Date	Stores the Date of Issue of a particular document
Author	Text	Stores the author name of a particular document
Date	Date	Stores the Date Brought on charge of a particular document
Type_of_Correspondance	Text	Stores the name of the Type of Correspondence for a particular document. This information is retrieved from the Type_of_Correspondance table.
Location	Text	Stores the Location of the document

The input design (database design) also refers to field size limit for each field in the database.

9) System testing

Testing performs a very critical role for quality assurance. A system is tested for failure and usability. Then the next stage is system testing, which verifies that whole set of programs work together. Following system testing is acceptance testing, or running the system with live data by the actual user.

The different testing methodologies include the following:

9.1) Unit Testing

In this testing, the testing of each module and the integration of the overall system is done. Unit testing becomes verification efforts on the smallest unit of software design in the module. This is also known as 'module testing'. The modules of the system are tested separately. The testing is carried out during the programming stage itself .In this testing step, each module is found to be working satisfactory as regarded to the expected output from the module.

9.2) Integrated Testing

Though each program works individually, they should work after linking them together. This is also referred to as interfacing. Data may be lost across the interface: one module can have an adverse effect on another. Subordinates after linking may not do the desired function expected by the main routine.

Integrated testing is a systematic way for constructing program structure while at the same time, conducting test to uncover errors associated with interface .In the testing, the programs were constructed and tested in small segments. Thus errors are easier to isolate.

Data Validation Testing

Data validation checking is done to see whether the corresponding entries made in different tables are done correctly. Proper validation checks are done is case of insertion and updating of tables, in order to see that no duplication of data has occurred. If any such case arises proper warning message will be displayed.

Double confirmation is done before the administrator deletes a data in order to get positive results and to see that no data have been deleted by accident.

9.3) Output Testing

After performing the validation testing, the next step in output asking the user about the format-required. Since no system could be useful if it does not produce the required output in the specified format. The output is displayed or generated by the system under consideration in two ways. As per needs of the user. For the hard copy also the output comes out as the specified requirements of the user. Hence the output testing does not result in any connection with the system.

9.4) User Acceptance Testing

User acceptance of the system is the key factor for the success of any system. The system under consideration is tested for user acceptance by constantly keeping in touch with prospective system at the time of developing and making changes wherever required.

9.5) Testing methodologies applied in the project

9.5.1) Unit Testing

Testing any unit involves:

1. Selection of Test Cases
2. Execution of Test Cases
3. Evaluation of the results of testing

The basic modules to be tested are:

Project

Sub Project

System

Chapters

Add Document Form

Search Document Information form

Edit Document form

Each unit has to be tested in such a way that it should execute independently of the other units.

9.5.2) Integrated Testing

As we know we have the following modules:

- Project
  - Sub Project
- System
  - Chapters
- Add Document Form
- Search Document Information form
- Edit Document form

So here, the sub modules such as Sub Project Form depends on the previous module the Project Module, as the subproject is added to the projects retrieved from the previous module. Similarly the sub module Add chapter form depends on the previous module the System module, as the chapter is added to the Systems retrieved from the previous module. Again other modules such as the Add document form, Search document form and Edit document form also partially retrieves the information from the previous modules such as Project, Subproject, System and Chapter along with few additional project document information.

Here mainly, the dependency (integrity) between the modules and the way in which the information is stored, searched and retrieved whenever needed is tested.

9.5.3) Data Validation Testing

This is a testing, which is used to check whether the value entered in every module is, valid or not. So in the software "Document Information System", all the information fields to be stored in the database has a certain criteria to be followed, if the information is within the defined criteria, it is found to be valid. The information fields with specific criteria are:

Information Field	Criteria	Explanation
Projects	Alphabetic	Only alphabets to be entered
Sub Projects	Alphanumeric	Alphabets as well as numbers can be entered
Systems	Alphabetic	Only alphabets to be entered
Chapter Name	Alphabetic	Only alphabets to be entered

Information Field	Criteria	Explanation
Document Number	Alphanumeric	Alphabets as well as numbers can be entered
Title	Alphabetic	Only alphabets to be entered
Keyword	Alphanumeric	Alphabets, number and special characters can be inserted
Chapter Name	Alphabetic	Only alphabets to be entered
Document Number	Alphanumeric	Alphabets as well as numbers can be entered.
Title	Alphabetic	Only alphabets to be entered
Keyword	Alphanumeric	Alphabets, number and special characters can be inserted.
Security _Classification	Alphabetic	Only alphabets to be entered
Type_of_Correspondance	Alphabetic	Only alphabets to be entered
Date_Of_Issue	Date	Format is dd/mm/yyyy
Date_Brought_on_Charge	Date	Format is dd/mm/yyyy
Location	Alphanumeric	Alphabets, number and special characteristics can be entered
Author	Alphabetic	Only alphabets to be entered

9.5.4) Output Testing

This is a testing, which is done to test the output of the particular information in the module or the display of the particular module or the display of the searched information in the search form.

So during this testing, the display of each module is tested and all the information entered into the database is tested to check whether it is displayed in the same format as specified.

9.5.5) User Acceptance Testing

This is a type of testing that is done to ensure the acceptance of the user who uses the modules developed. As this application is developed for the purpose of maintaining the document information, this is basically used while we want to add new information into the database or to retrieve the information and maintain, so all the modules of the software are tested to seek the acceptance by the user.

User acceptance testing is the key factor for the success of any system, so this is one of the most important testing carried out on my project to see whether the generated output is satisfactory to the user. This testing also ensures if the user is provided with exact information.

Test Report

Module	Test	Message
Login	Enter wrong user name and password	Error Message
	Enter correct user name and wrong password	Error Message
	Enter correct user name and password.	Successful!!
Project	Enter/Add the project name as alphanumeric	Error Message(“Enter only Alphabets)
	Enter/Add the project name as alphabetic	Successful!!
	Enter/Add the project name same as in the Project list.	Found!! Add another name
	Enter/Add the new project name apart from the Project list.	Successful!!

Sub-project	If the particular project is not selected and if we try to Enter/Add a new subproject If the list is empty and if try deleting…then If project is selected, then the sub projects of selected project are displayed. Now: Add existing subproject	"Select the particular project" No subprojects selected. Select the subproject to delete. Found!! Add a different name

Module	**Test**	**Message**
	Add a new sub project	Successful!!
System	Enter/Add the system name as alphanumeric Enter/Add the system name as alphabetic Enter/Add the system name same as in the Project list. Enter/Add the new system name apart from the System list.	Error Message("Enter only Alphabets) Successful!! Found!! Add another name Successful!!
Add New Chapter	Enter/Add the chapter name as alphanumeric and chapter number as alphanumeric Enter/Add the chapter name as alphabetic and chapter number as numeric Enter/Add the chapter name or chapter number same as in the Chapter list. Enter/Add the new chapter name and chapter number apart from the chapter list.	Error Message("Enter only Alphabets" for Chapter name ,"Enter only digits" for chapter Number) Successful!! Found!! Add another name Successful!!

Segregate Chapter	If the particular system is not selected and if we try to Enter/Add/segregate a new chapter If the list is empty and if try deleting…then If system is selected, then the chapters of selected systems are displayed.	"Select the particular system" No chapters selected. Select the chapter to delete.

Module	**Test**	**Message**
	Now Segregate/arrange the existing chapter to the selected system	Found!! Add a different name
Add New Document Form	Add/Save Document Information If: Project Field is blank System Field is blank Topic/Chapter field is blank Security Classification is blank Type of correspondence is blank Document Number is blank Title is blank Location is blank Author is blank Else: If all specified fields are filled	 "Please select Projects" "Please select Systems" "Please select Chapters" "Please select security classification" "Please select Type of correspondence" "Please enter Document Number" "Please enter Document Title" "Please enter Location" "Please enter Author" Successful!! "Saved"
Search form	If records are empty: Delete Edit Else Delete Edit If no option is selected and if general search text is empty If any option is opted for searching and searched	 No records to delete No records to edit Successful!! Successful!! No operation Successful!!

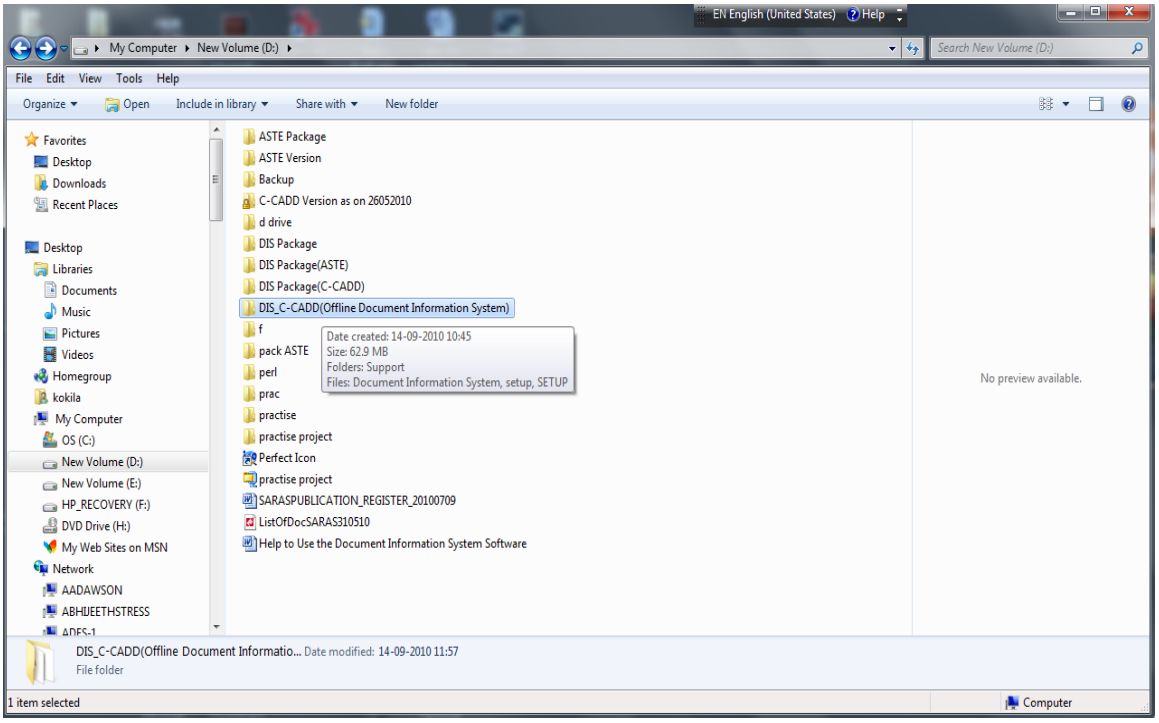
10) Software Installation and Server Path Settings

Software Installation:

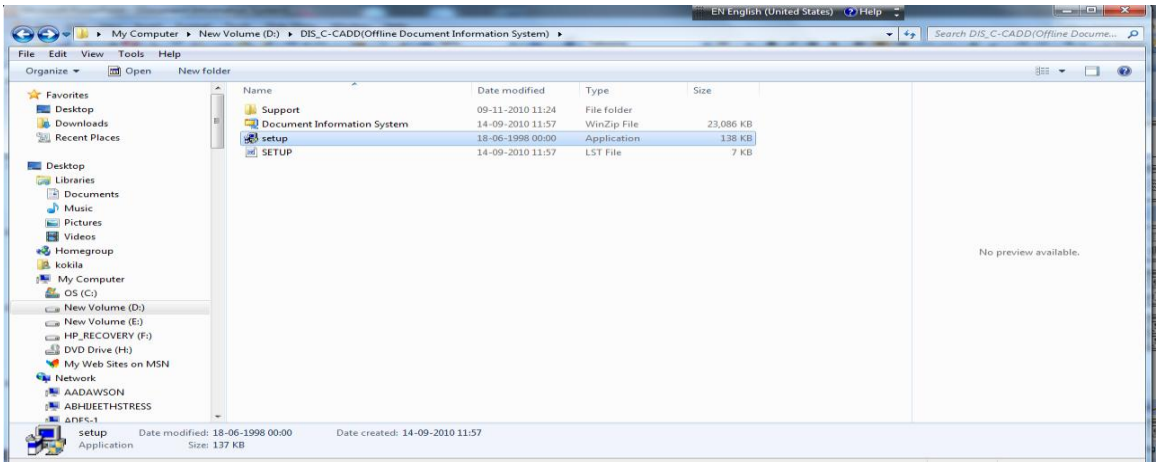
1.Copy the software Package folder in the paricular PC where you want to install.
2.Go to the Setup file in the particular folder and follow the steps.
3. Once it is installed successfully, you can find the shortcut of the executable file on the "Start up"menu on your destop window.

Steps for Installation:

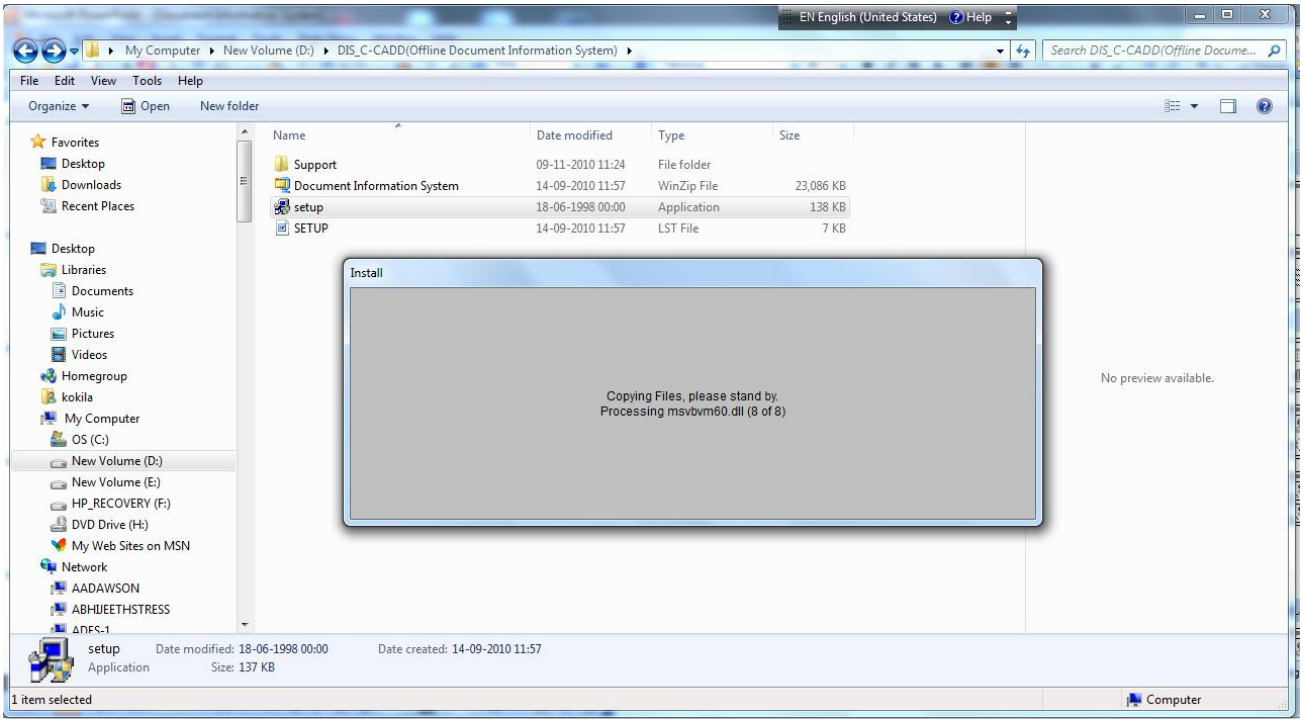
- **Step1: Store the Software Package in the system, then double click on the package folder.**



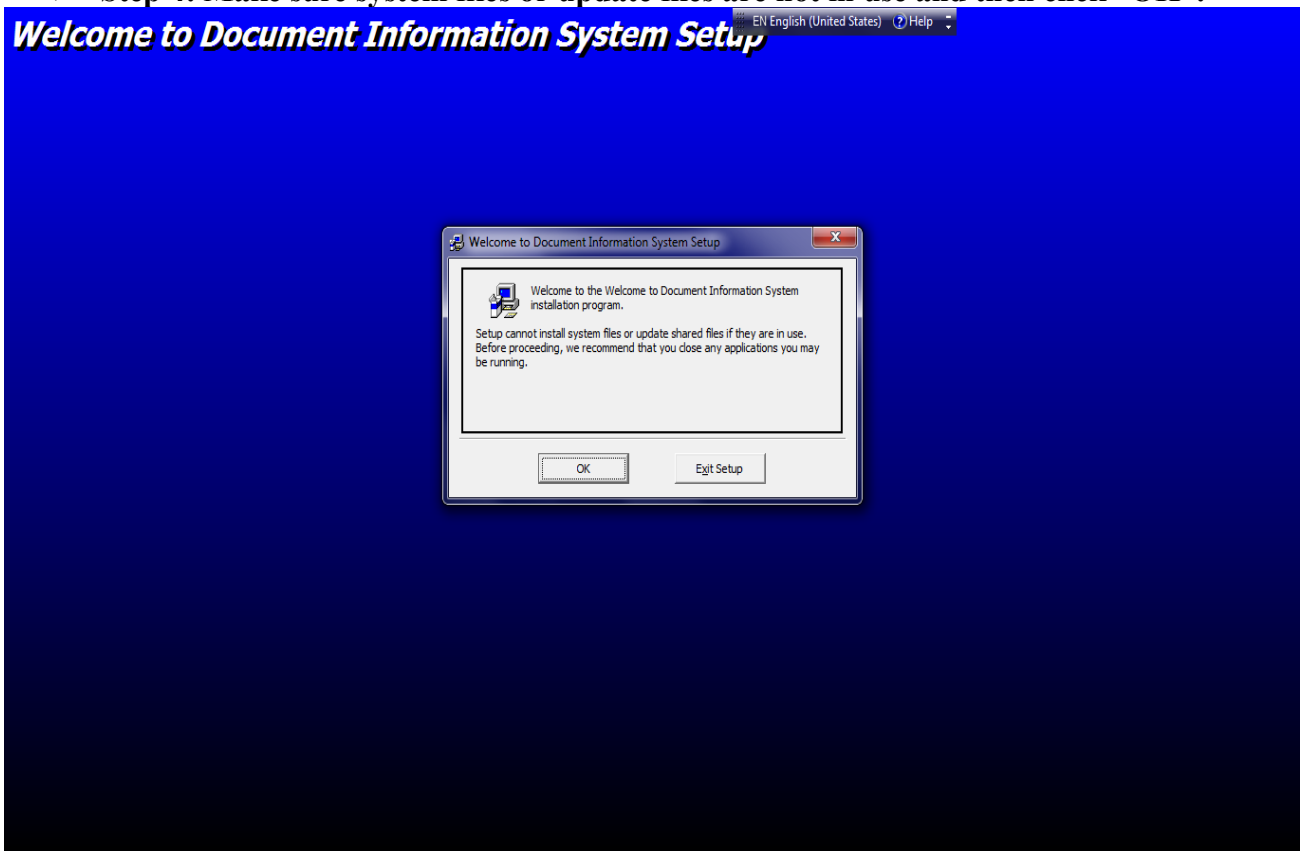
- **Step 2: A "Setup" file will be found in the folder, double click on that.**



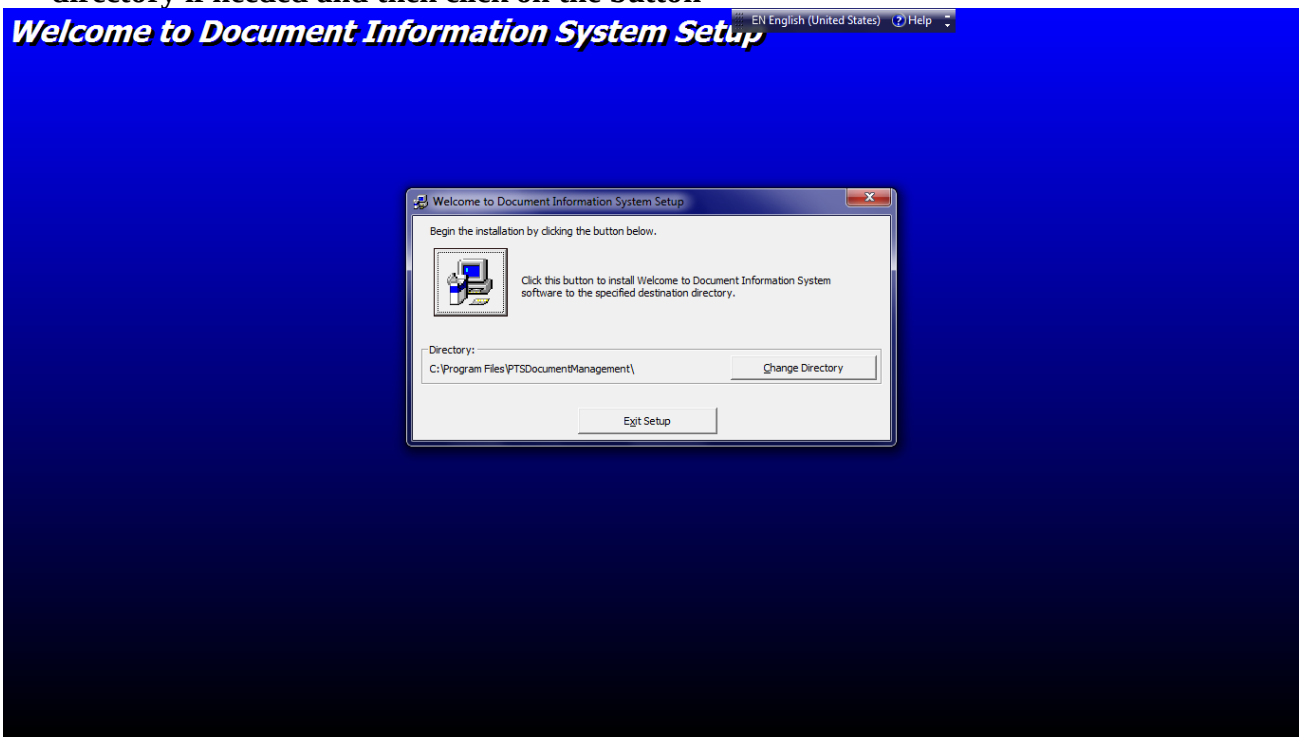
- **Step 3: The installation of the software will be started**



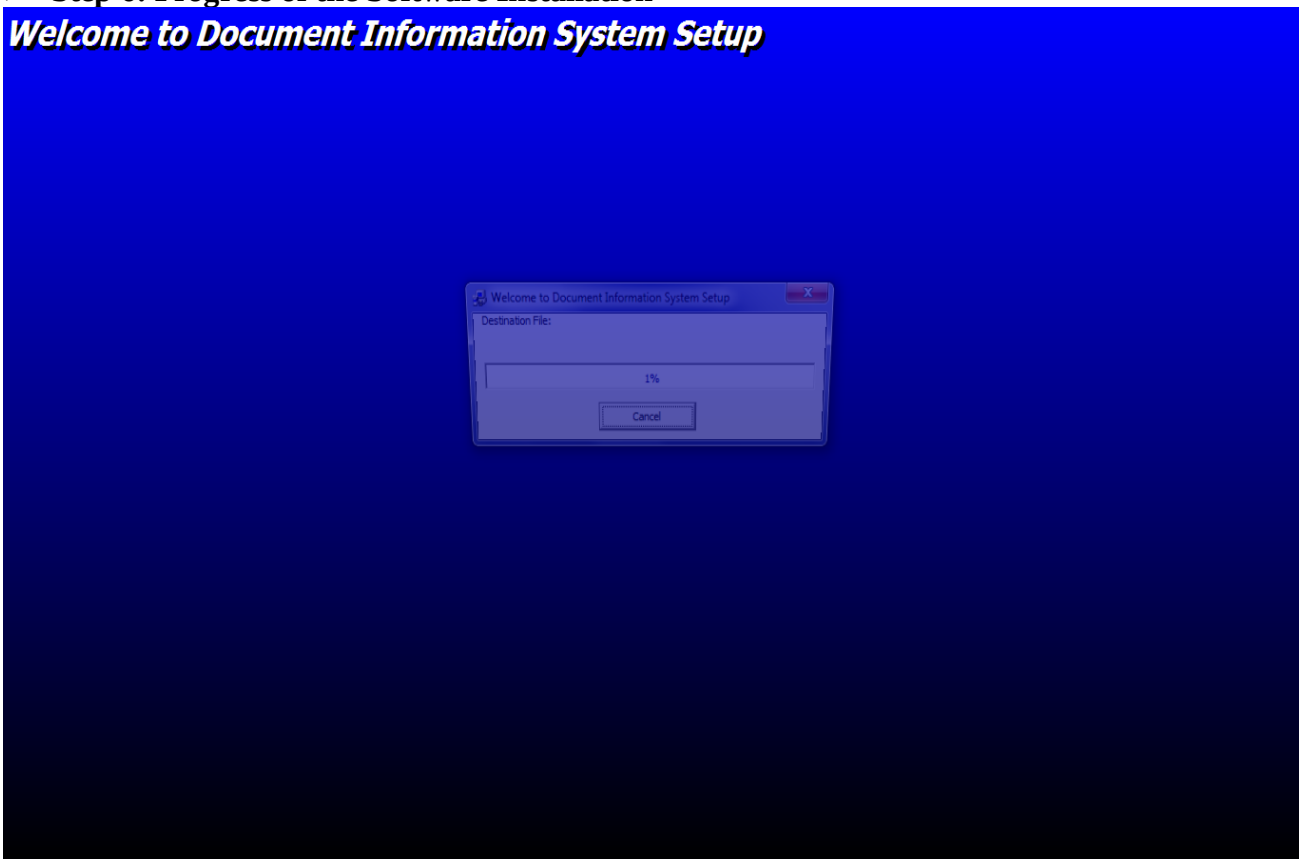
- **Step 4: Make sure system files or update files are not in use and then click “OK”.**



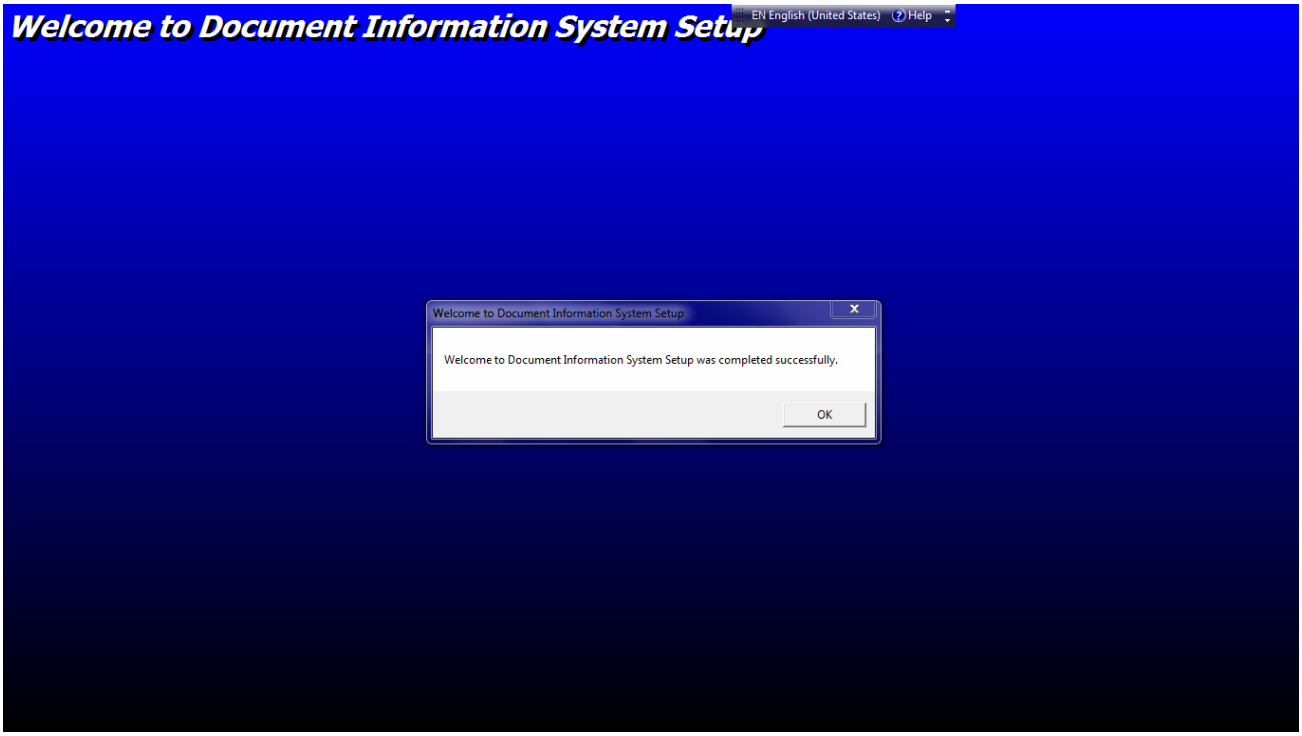
- **Step 5: Here the software can be installed in any particular drive, so we change the directory if needed and then click on the button**



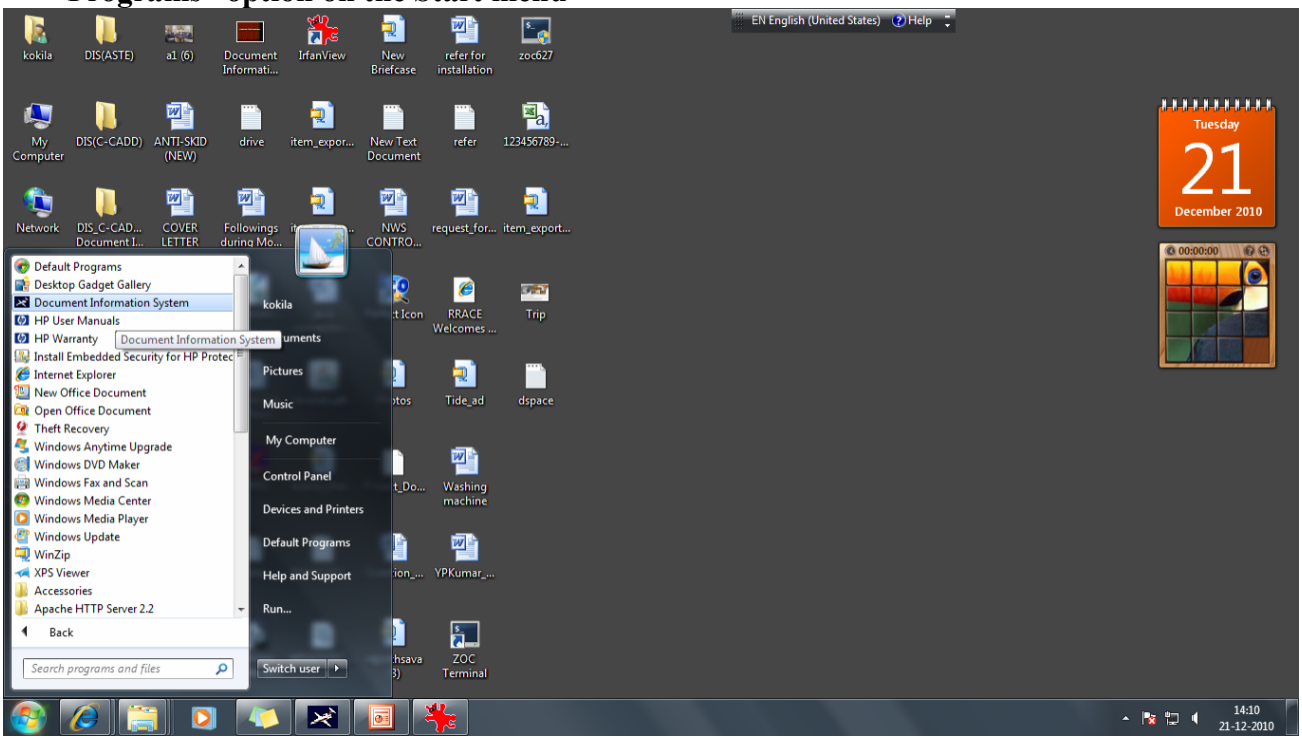
- **Step 6: Progress of the Software Installation**



- **Step 7 :Installation is completed**



- **Step 8 : Once the Software is installed, We can find the shortcut of the exe on the "Programs" option on the Start menu**



Server Path Settings:

1) First of all please make sure of the server path of the database.If the server path has to be changed, then follow the following steps,

Please Note: Make sure Visual Studio 6.0 and VB6 with all the required components and MS-Access 6.0 is installed in the System if you want to change the server path.

1. Go to the Software Code folder in the current folder
2. Find the MS-Access Database called "PTSDatabase.mdb"
3. Put that in a folder and name the folder accordingly to your convinience and save the folder in the System which you intend to use as a server and share the folder on the network.
4. Save the folder Software Code folder in the system where you want to change the path.
5. Go to "Visual Basic Project" file called "PTSDocumentation1"in that folder and double click on that,the project along with the forms and coding will be opened.
6. Double click on any of the form and find the connection string statement,usually it will be in Form_Load() event in every form,"....."Provider=Microsoft.Jet.OLEDB.4.0;Data Source=" & ("\\KOKILA\ASTEDB\PTSDatabase.mdb") & "; Jet OLEDB:Database Password=kokila;""

Note: The path can be: \\KOKILA\ASTEDB\PTSDatabase.mdb
Or \\KOKILA\Database\PTSDatabase.mdb

Change this string in the coding of every form to:
".."Provider=Microsoft.Jet.OLEDB.4.0; Data Source=" & ("\\Your ServerName\Your Folder Name\PTSDatabase.mdb") & ";Jet OLEDB:Database Password=your password name for the database;"

7 After the previous step save the project using the menu options "Go to File and Save project"

8 Once the project is saved, Make the executable file by going to File menu option and using the option "Make Document Information System.exe"

9 Once the executable file is created,using the "Package and Deployment Wizard" in the Tools menu,create a package of this in a folder by following the steps in that wizard"

10 Now the Package folder created is ready for usuage,the folder can be copied to any system on the network and can be executed by double clicking on the executable file once the Package is setup using the Setup file.

11) Conclusions

The main purpose of developing this software was to maintain and keep track of all the required project document information, so that the information can be searched/retrieved whenever necessary. This is an efficient software to maintain the document information of various flight projects as the software in made centralized on LAN. The information can be viewed from many systems simultaneously.

It is found that the project is useful for the following reasons:

- The software to certain extent is secure with Admin Password rights as no modifications are possible from other users except the administrator.
- The software is easy to use for viewing the existing information.
- It is capable of centralized operation of database entries on LAN. Therefore, it has an advantage of viewing the document information by multiple users at the same time.
- It is having an efficient Search mechanism for searching the document information as it has multiple search options.

12) Further enhancements

As there was an immediate need to maintain various flight project document information, this project was initiated and completed. As far as the current existing project is concerned, it solves the basic requirement of storing, retrieving, searching and accessing the specifically required project document (bibliographic) information. This comes as a very satisfying solution when it is to be used within a limited area of network.

The usage of this software can be further enhanced by adding new modules, generating reports. As there is a necessity for using this software widely, this software can also be further enhanced to make it as a web based application by making use of the appropriate information technology as per the requirement.

13) Acknowledgements

The authors express their thanks to Amit Kumar Khatri of C-CADD for helping during initial development of this software. We would like to thank the officers from ASTE (IAF) for their valuable suggestions to refine the structure of search and retrieval functions. Colleagues from C-CADD are thanked for participating in testing phase of this software. We would like to thank Dr H.N.V. Dutt especially for complete guidance during initiation and development of the software as well as providing appropriate and capable computing facility.

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Keywords
Software, bibliographic information, network, search, retrieval, secure

Summary

During various activities undertaken for design, implementation and testing of various aircraft development projects like SARAS, HANSA, NM5, etc at C-CADD, NAL, numerous project documents and internal reports were released. There was a need to keep track of bibliographic details of these documents, so that their key information can be easily retrieved and accessed.

To fulfill the above necessity, the software "Document Information System" is developed to maintain the offline information of various documents for various flight projects.

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